Marine Prediction Center's Radiofacsimile Charts User's Guide

Marine Prediction Center Home Page; URL: http://www.mpc.ncep.noaa.gov/

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Marine Prediction Center Radiofacsimile Program

The National Weather Service (NWS) has the responsibility for issuing warnings and forecasts to protect life and property in the maritime community. The area of responsibility covers most of the North Atlantic and North Pacific N of 30N with graphical products covering the marine areas S to 15N. Most of these products are in graphical format and prepared by the NWS's National Centers For Enviromental Prediction (NCEP) by its Marine Prediction Center (MPC). The Marine Forecast Branch (MFB) a division of MPC at Camp Springs, MD, near Washington D.C. is resposible for the issuance of various marine products. These products are distributed by high-frequency (HF) Radiofacsimile broadcast via the US Coast Guard Communications Centers at Boston, MA, and Pt Reyes, CA, for the North Atlantic and North Pacific Oceans, respectively. Also, these products are available on the internet on the Marine Prediction Center's Home Page.

High Seas Products

Vessels engaged in national and international trade routinely conduct transoceanic voyages with fast turn around times between ports of call. Ships require timely and accurate presentation of meteorological and oceanographic information for a large geographical area to plan for safe and economical operations. This information is most user friendly when presented in graphic form. The MPC, which includes an operational service unit, the Marine Forecast Branch (MFB), recognizes HF Radiofacsimile as the most widely used medium by ships for receipt of graphically displayed environmental analyses and forecasts.

The following suite of products addresses the common needs and requirements of professional mariners engaged in transoceanic crossings and offers the maritime community complete and timely graphic products to support navigation safety and operating efficiency. Three primary types of products are issued: upper air 500 millibar (mb) charts, surface pressure, and sea state charts.

Additional charts include sea surface temperatures (SST), tropical streamline and surface analyses, and meteorological satellite imagery. Users whose specific or specialized requirements for high seas information are not met by these general safety-oriented products are referred to the private meteorological and oceanographic sector for assistance.

Base Maps

There are two types of base maps. The larger scale ocean base map is a mercator projection and has latitude and longitude marked in 10 degree increments. The second type of base map is the regional which encompasses the west and east coasts of the US covering subsections of the Atlantic and Pacific high seas areas in polar stereographic projection.

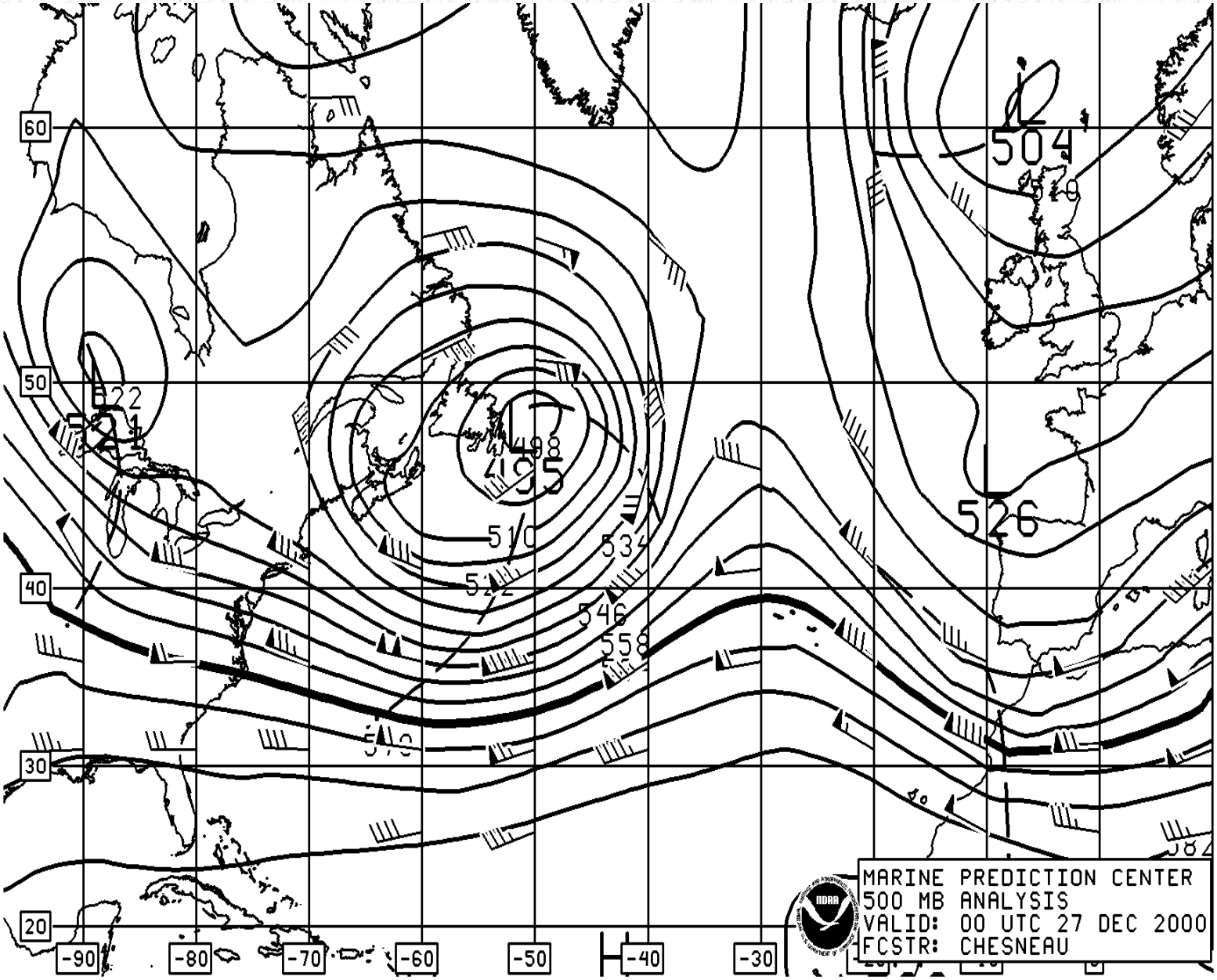
NOTE about examples in the User's Guide :

In the descriptions of the marine radiofacsimile charts available, examples of various charts are included within parenthese and are underlined, (48-Hr 12Z Surface Forecast).

Upper Air 500-MB Products

The 500-mb charts are produced from a computer model of the atmosphere. These products are automated unmodified computer outputs that depict height contours above the earth's surface (geopotential heights) at 60 meter intervals. Wind speeds of 30 knots and greater are shown with wind barb increments of 5 or 10 knots. Embedded within the 500-mb height field are short wave troughs, generally 50 degrees or less in longitude. These are drawn on the charts as bold dashed lines. These short wave troughs will assist the mariner in locating surface low pressure systems or developing lows on frontal waves. The 500-mb winds approximate the speed of motion of surface extra-tropical lows (often about 1/3 to 1/2 of the 500-mb wind speed) and surface wind force (approximately 50 percent), particularly in the colder SW quadrant. The 5640 meter height contour is highlighted since this height contour is widely used by the professional mariner for general surface storm track direction and the southern extent of Beaufort Force 7 (28-33 knot) or greater surface winds in the winter, and force 6 (22-27 knot) winds in summer. The 500-mb products are not intended to be used alone. The mariner is strongly advised to examine other Radiofacsimile products described in this User's Guide in order to derive a complete picture of weather and sea state conditions.

500-mb Analyses



NWS/NCEP - Marine Prediction Center

These analyses are generated twice a day at 00Z and 12Z (Atlantic 00Z 500-mb). They depict synoptic scale flow patterns, location, and amplitude of long and short waves. These synoptic scale features can be compared with previous analyses to determine the movement and trends of the upper air pattern. They can be used in conjunction with the surface analyses, sea state analyses, and meteorological satellite imagery, which are valid at the same synoptic time.

6-Hour 500-mb Forecasts

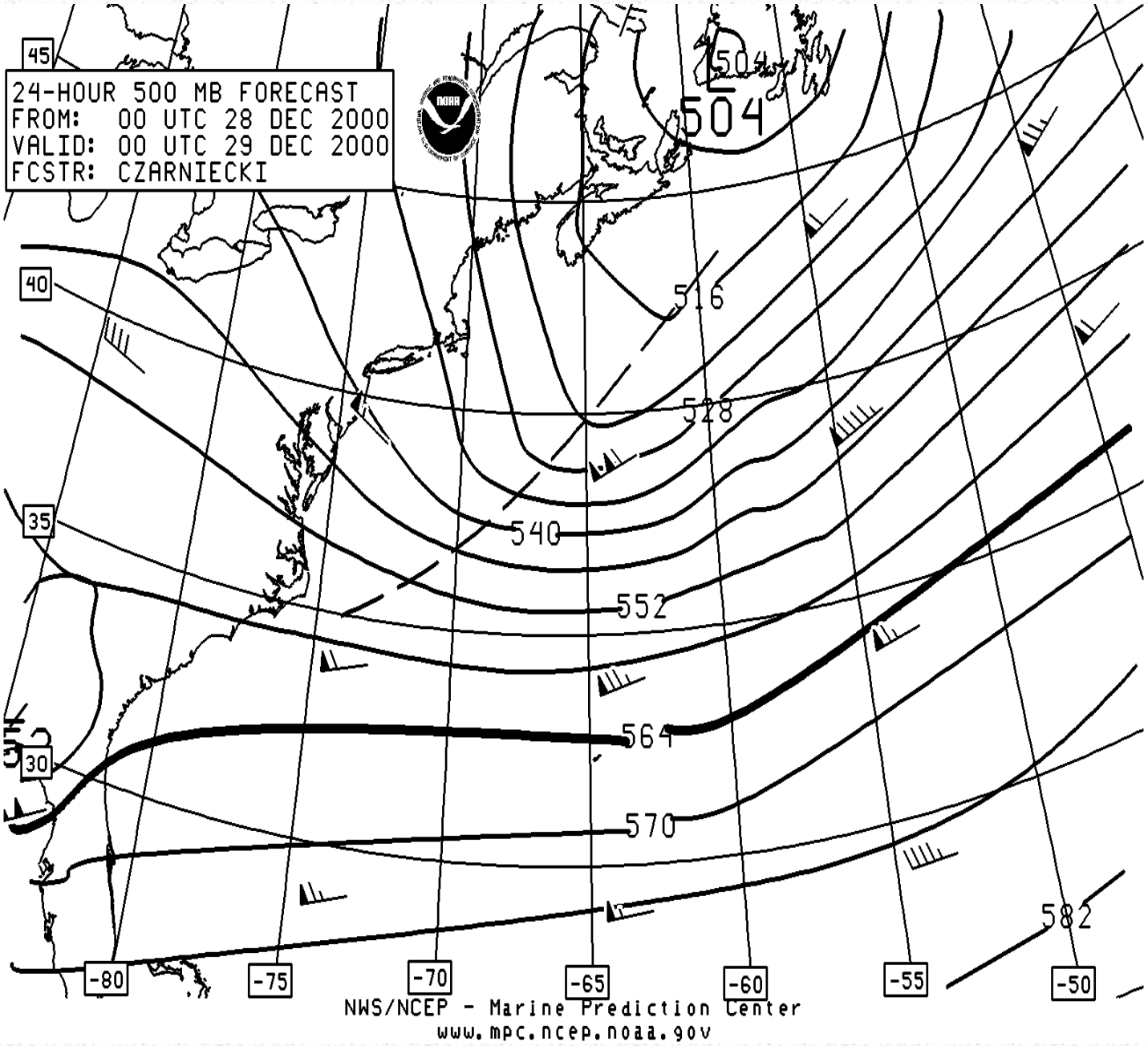
These forecasts come from the numerical model forecast 6 hours earlier and are used when the current 500-mb analysis is not available.

24-Hour 500-mb Forecasts

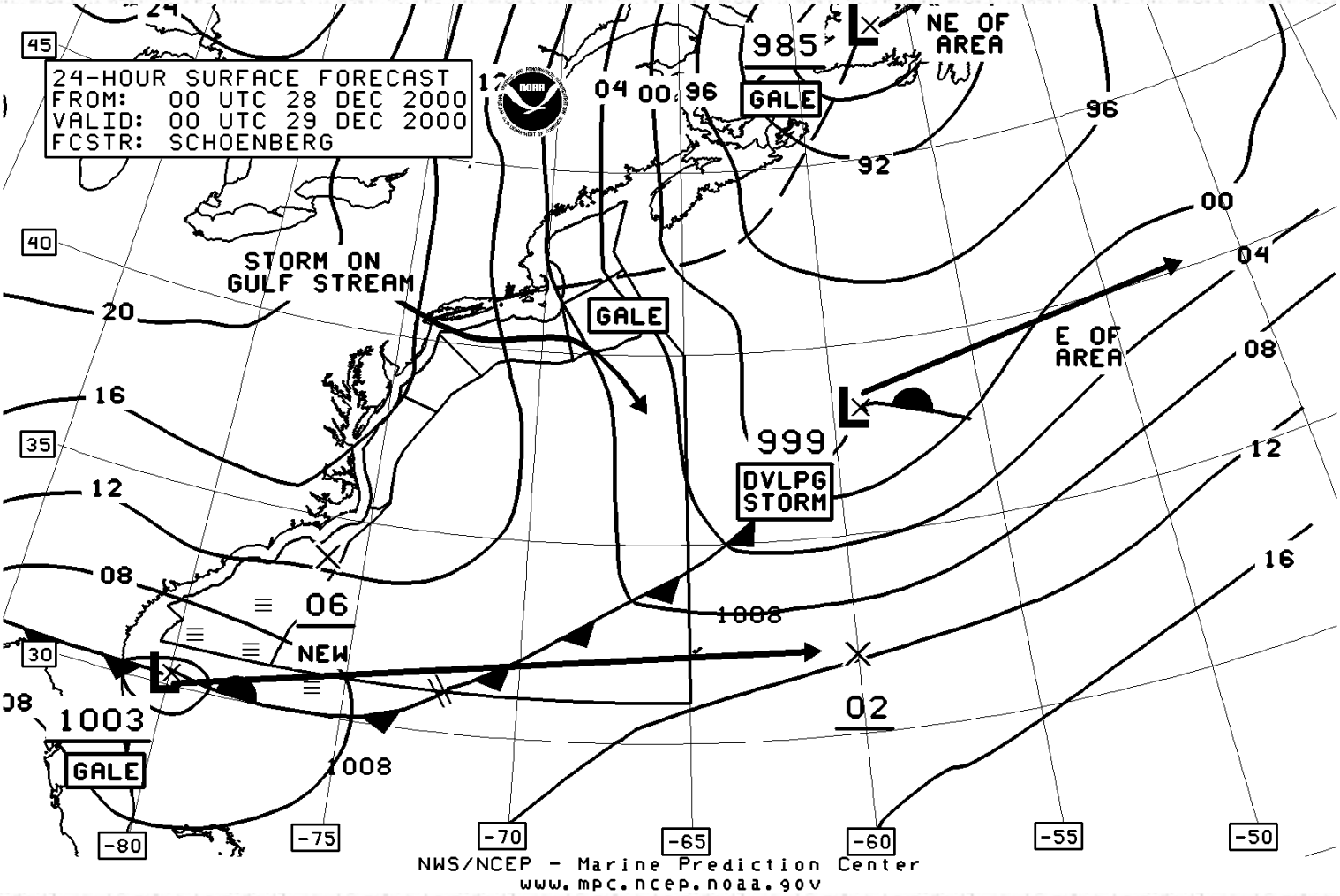
These forecasts generated twice a day at 00Z and 12Z for the regional Atlantic ocean are based on the

latest numerical forecast model run. These products can be used to compare changes in flow patterns from the latest 500-mb analyses to follow the progression of short waves identified from the most recent 500-mb analyses. The 500-mb 24-Hour Forecasts can be used in conjunction with the Surface and Sea State 24-hour forcasts products.

500-mb 24-Hour Forecast



Surface


24-HOUR SURFACE FORECAST
FROM: 00 UTC 28 DEC 2000
VALID: 00 UTC 29 DEC 2000
FCSTR: SCHOENBERG
985
NE OF AREA
GALE
STORM ON GULF STREAM
GALE
E OF AREA
999
DVLPG STORM
06
NEW
1008
02
1003
GALE
1008
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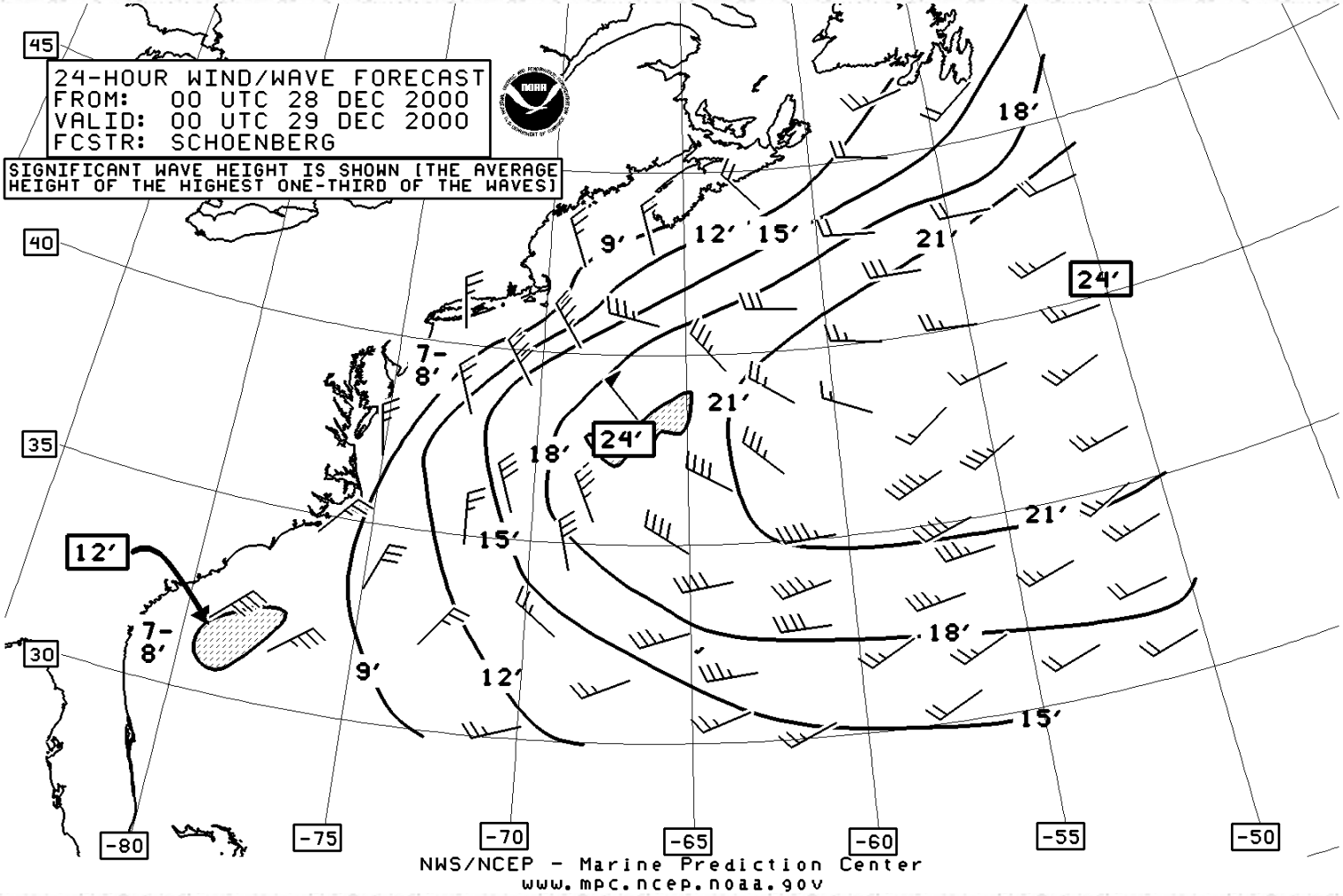
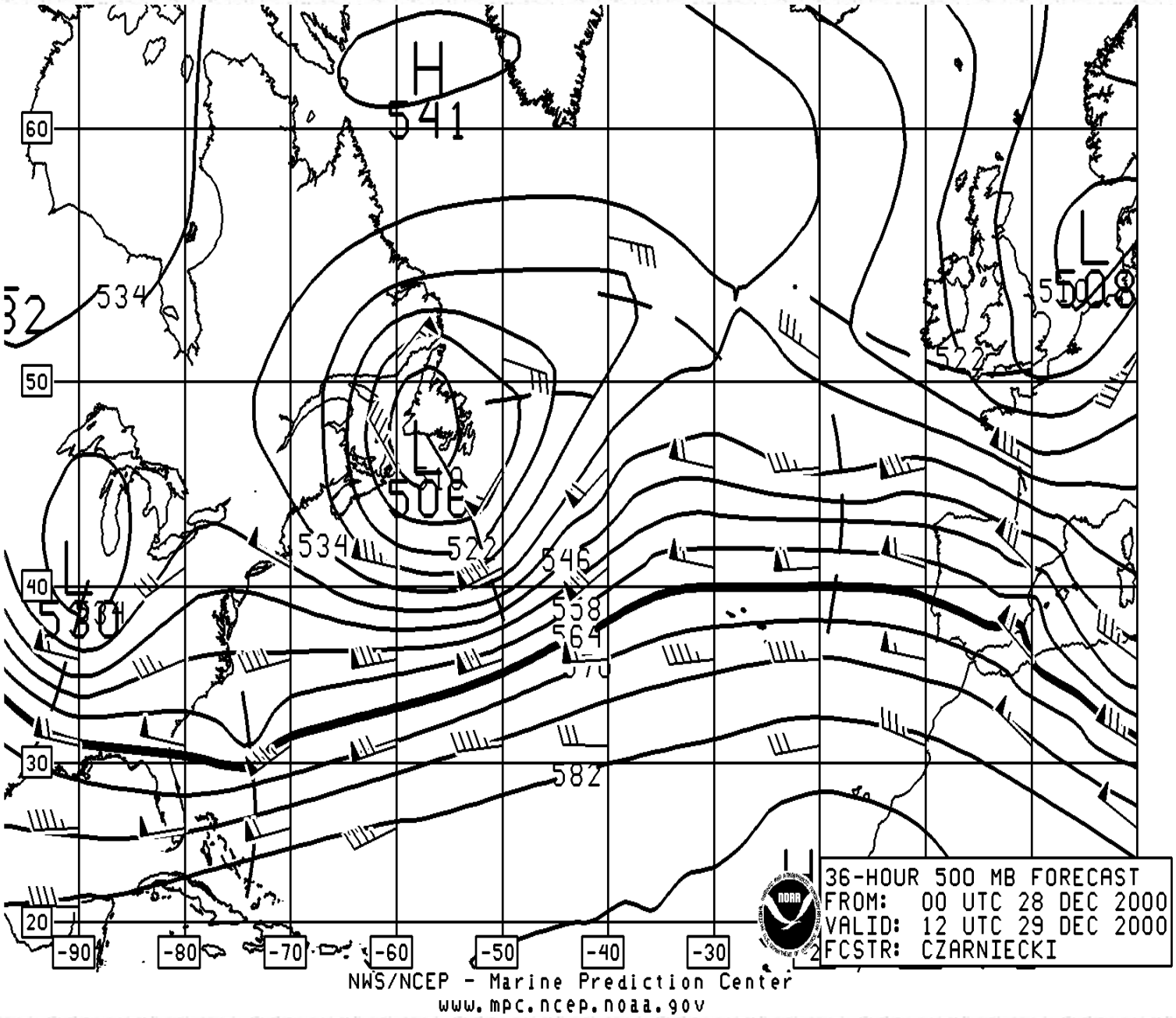
Sea State



36-Hour 500-mb Forecasts

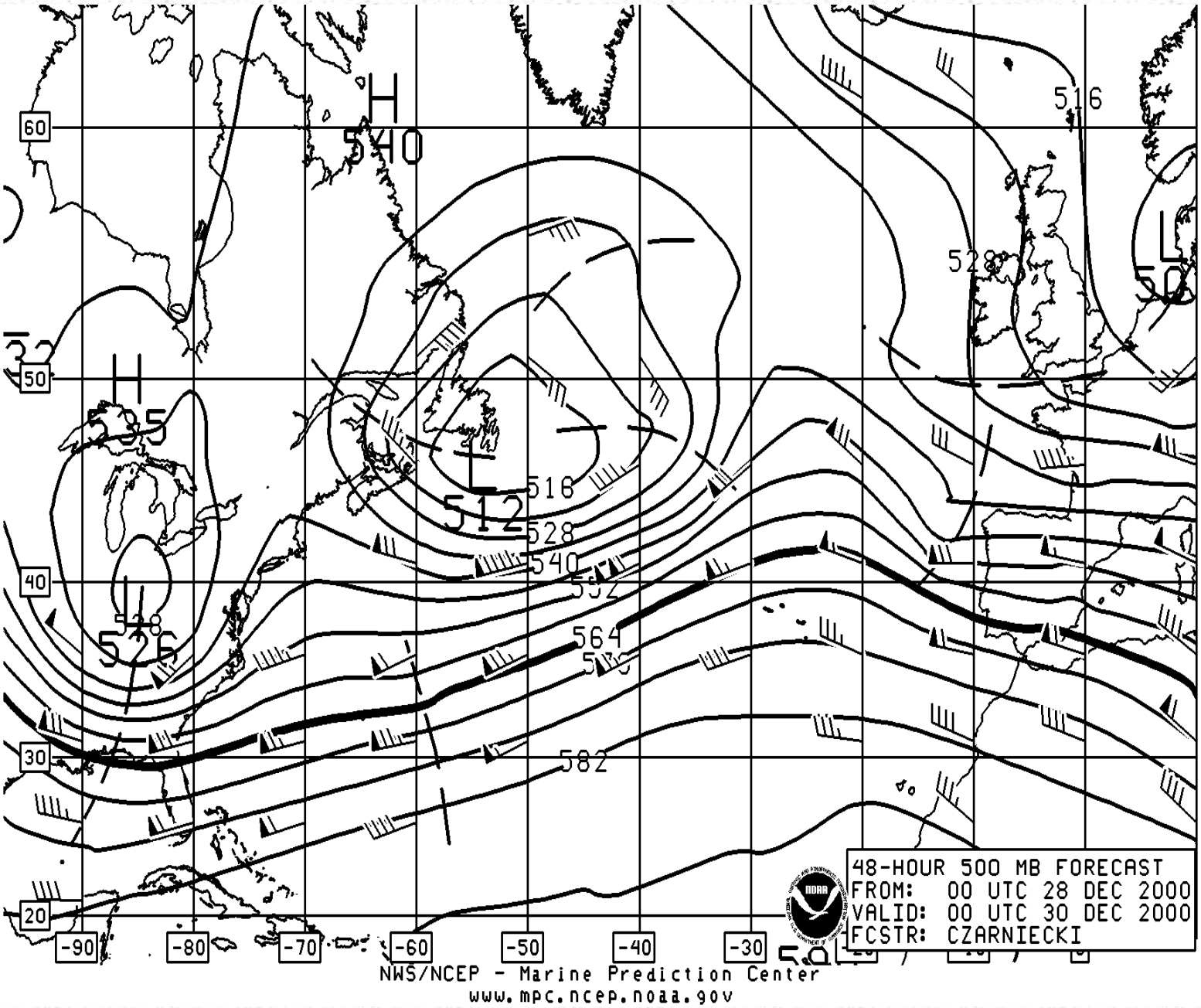
These forecasts generated twice a day at 00Z and 12Z for the Atlantic ocean are based on the latest numerical forecast model run. See 48-Hour 500-mb Forecast for further details.



48-Hour 500-mb Forecasts

These forecasts generated twice a day at 00Z and 12Z for each ocean are based on the latest numerical forecast model run. These products can be used to compare changes in flow patterns from the latest 500-mb analyses to follow the progression of short waves identified from the most recent 500-mb analyses. The 500-mb 48-Hour Forecasts can be used in conjunction with the Surface and Wind/Wave 48-hour forecast products. Comparison or verification of previous 48-hour 500-mb Forecasts with the most current 500-mb analysis can establish confidence in subsequent forecasts.

500-mb 48-Hour Forcast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564
582
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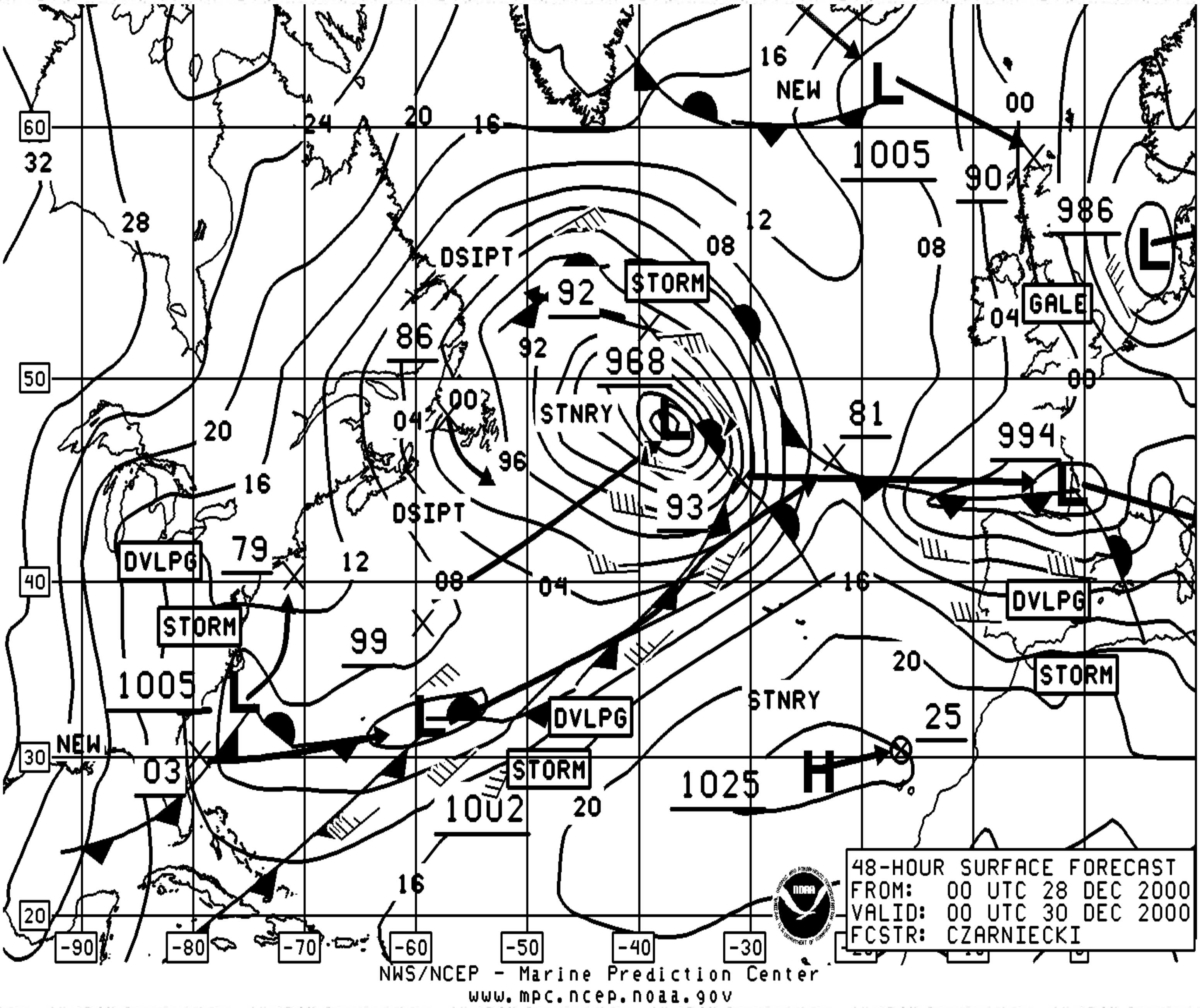
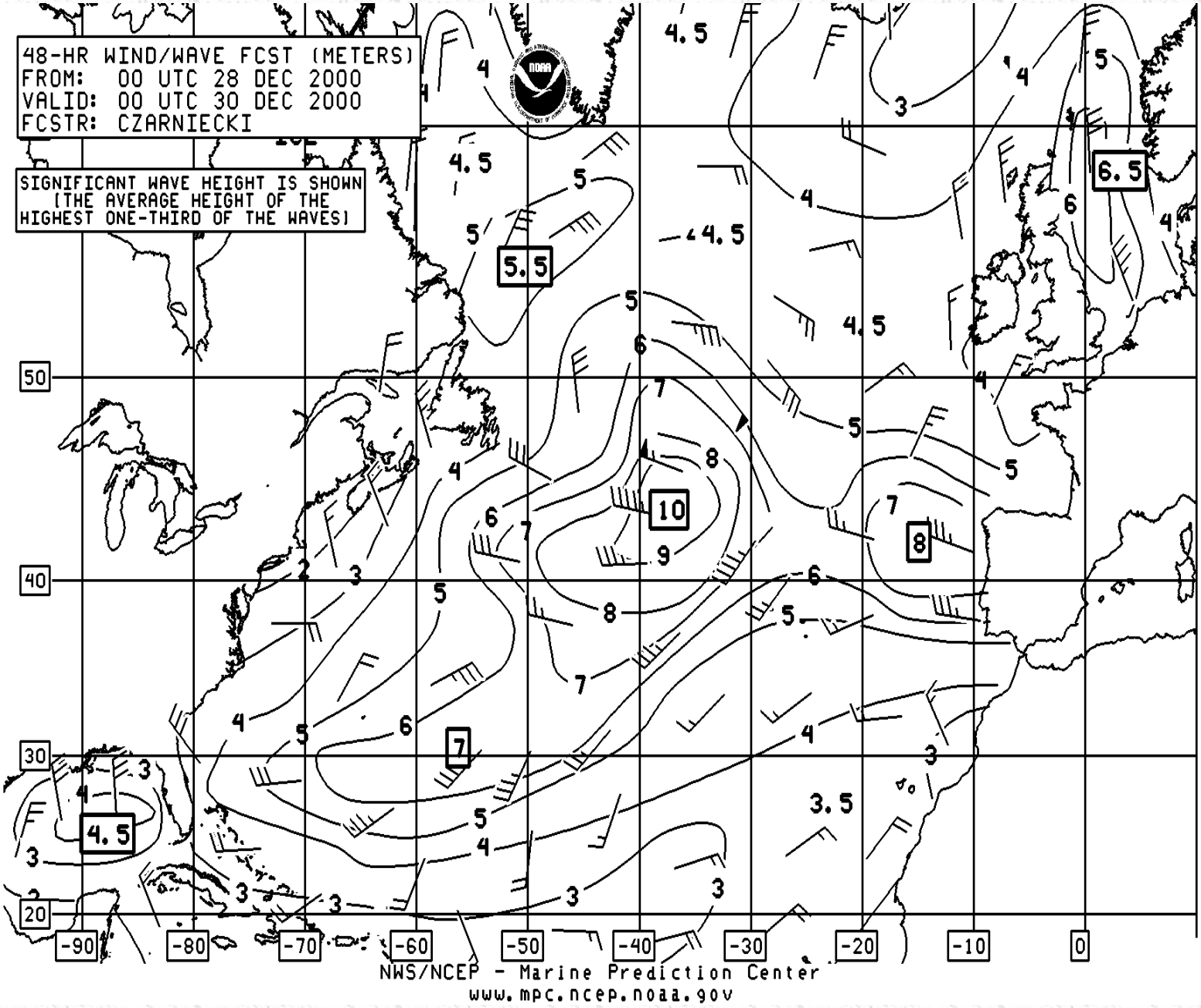
-90
-80
-70
-60
-50
-40
-30
48-HOUR 500 MB FORECAST
FROM: 00 UTC 28 DEC 2000
VALID: 00 UTC 30 DEC 2000
FCSTR: CZARNIECKI
NWS/NCEP - Marine Prediction Center
www.mpc.ncep.noaa.gov

Surface


48-HOUR SURFACE FORECAST
FROM: 00 UTC 28 DEC 2000
VALID: 00 UTC 30 DEC 2000
FCSTR: CZARNIECKI
NWS/NCEP - Marine Prediction Center
www.mpc.ncep.noaa.gov
STORM
GALE
DVLPG
DSIPT
STNRY
NEW
968
1005
1025
1002
986
994

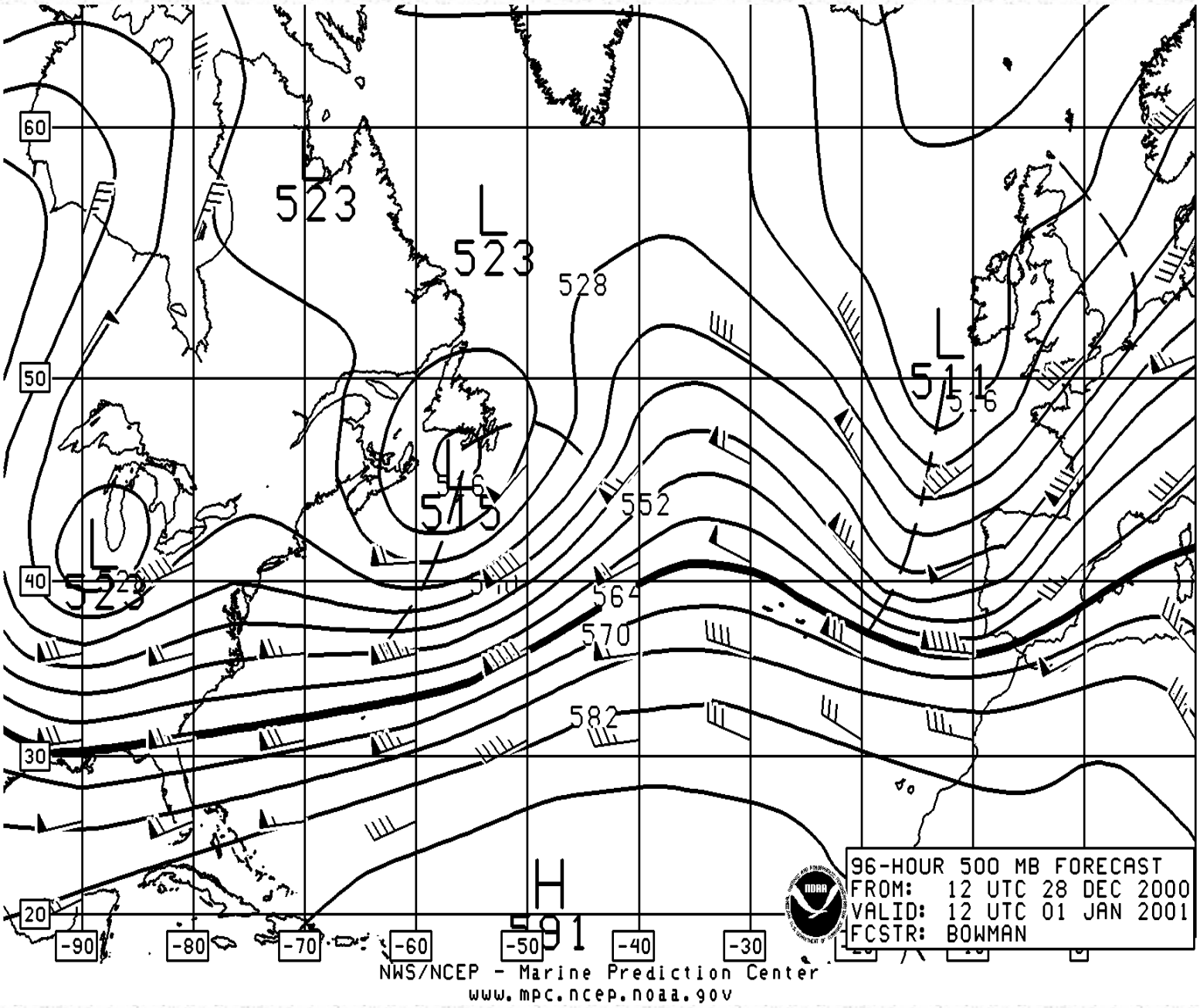
Wind / Wave



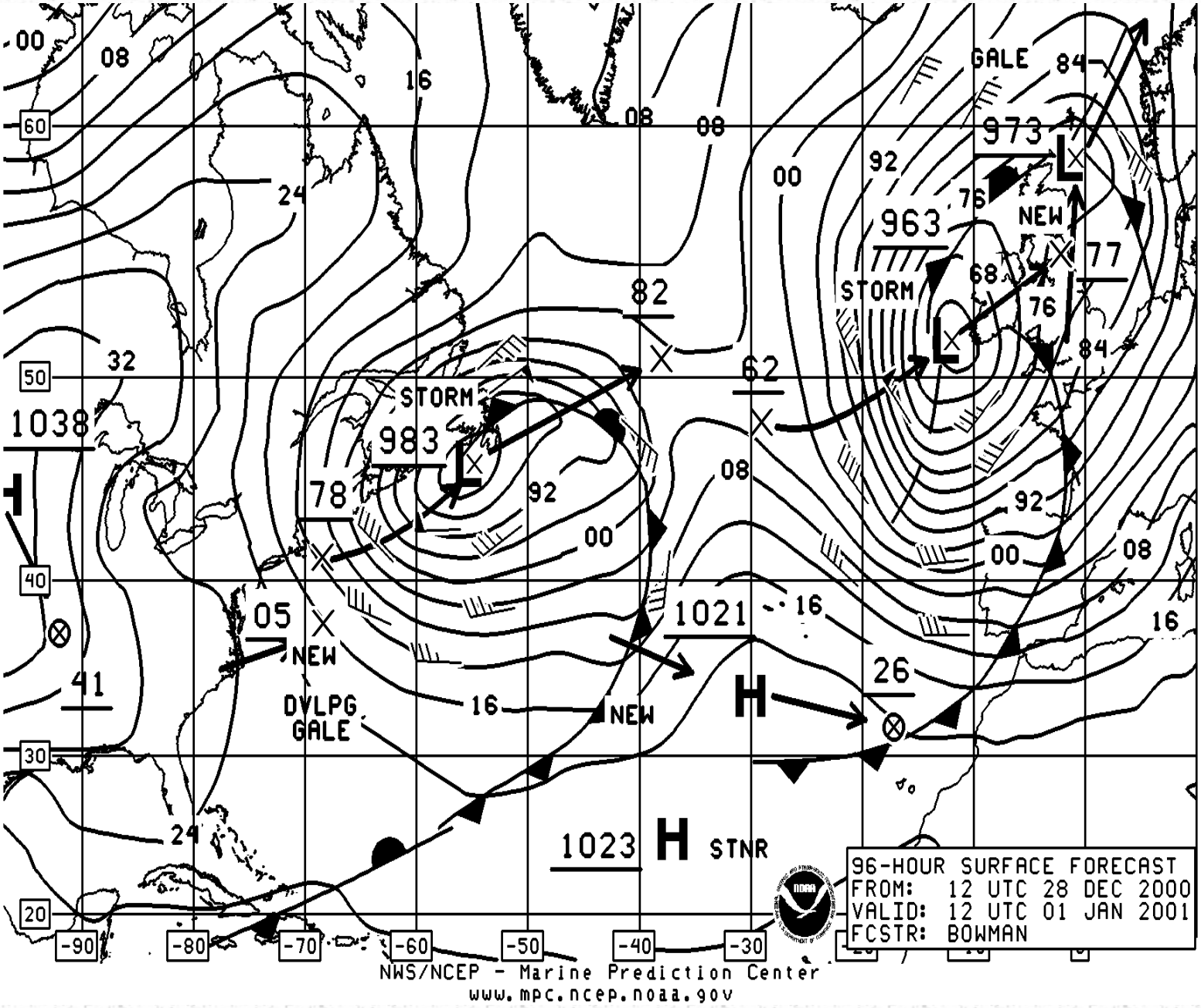
96-Hour 500-mb Forecasts

These forecasts generated once a day at 00Z from the latest numerical model run. These products can be used to compare changes in flow patterns from the latest 48-hour 500-mb forecast to follow the progression of short waves identified from the most recent model guidance. The 500-mb 96-Hour Forecasts can be used in conjunction with the 96-hour Surface Forecast product.

500-mb 96-Hour Forcast



96-Hour Surface Forecast



Surface Products

These products include four surface analyses per day transmitted in two parts and two 48-Hour Surface Forecasts daily. The computer workstation aided surface analyses depict isobars, surface winds, frontal systems (occluded, stationary, cold, and warm), low and high pressure center positions, and central pressure. The 24 hour track history and 24 hour forecast position of each synoptic scale system's position and central pressure are displayed on 48-hour surface forecasts. Systems having or expected to have synoptic scale "Gale" or "Storm" conditions are labeled in bold capital letters. Similarly systems expected to develop "Gale" or "Storm" conditions in 36 hours have labels of "Developing Gale" or "Developing Storm". Surface low pressure falls of 24 mb or greater during a 24 hour period are denoted in large capital letters as "RAPIDLY INTENSIFYING".

Standard abbreviations:

DSIPT - DISSIPATE
STNRY - STATIONARY
WKNG - WEAKENING
RPDLY - RAPIDLY
FRMG - FORMING
MOVG - MOVING
INLD - INLAND
DVLPG - DEVELOPING
COMB - COMBINED
DCRS - DECREASE
INCRS - INCREASE
INTSFY - INTENSIFY
Q-STNRY - QUASI-STNRY

For further information on terms or abbreviations used on surface products go to the section Key terms & Symbols listed below.

For tropical cyclones, the alphanumeric description of the analyses or forecast time are displayed in bold capital letters adjacent to the tropical cyclone's position with the appropriate cyclone symbol.

TYPHOON or HURRICANE or TROPICAL STORM "NAME"
LATITUDE ___ LONGITUDE ___
MAX WINDS___ KT G (GUST) ___KT
MOV DIR ___ (DEGREES) AT __KT

A 24-hour tropical cyclone symbol forecast position will be depicted on all surface analyses. Both 24-hour and 72-hour tropical cyclone positions will appear on the 48-hour surface forecasts. Mariners are strongly advised to rely on the latest warnings from the Tropical Prediction Center's (TPC) National Hurricane Center (NHC) , which covers the Atlantic and the Eastern Pacific Oceans east of 140W, and the Central Pacific Hurricane Warning Center (PHNL) covering the Eastern and Central Pacific Ocean west of 140W to the international dateline (180), and the Joint Typhoon Warning Center (JTWC), covering the Western Pacific west of 180.

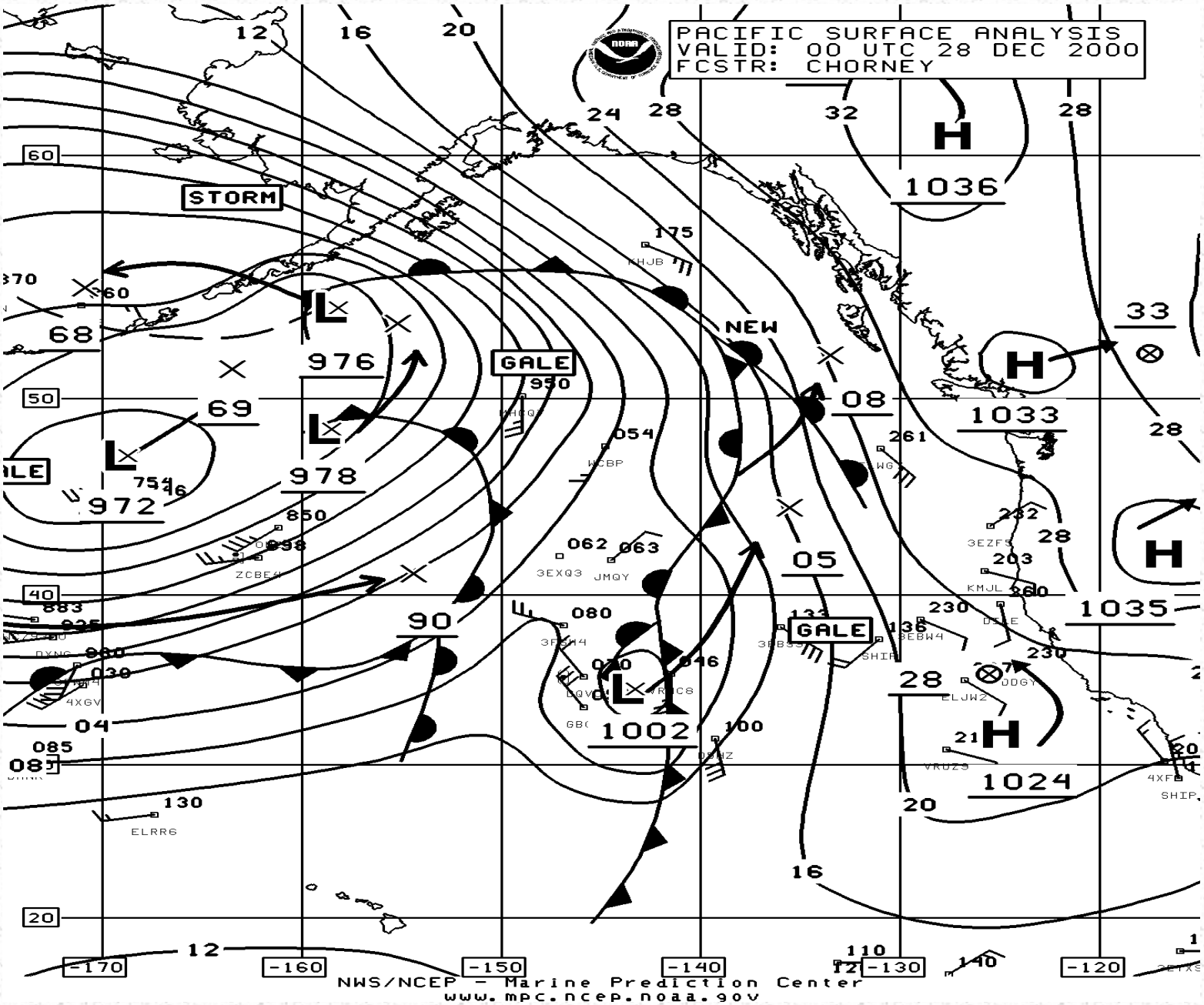
The surface forecasts produced by our marine meteorologists are derived by comparing several U.S. and foreign government agencies forecast models. As a result of the blending of these different model solutions, the surface forecasts may not exactly coincide with the corresponding automated 500 mb forecasts.

Surface Analyses (Parts 1&2)

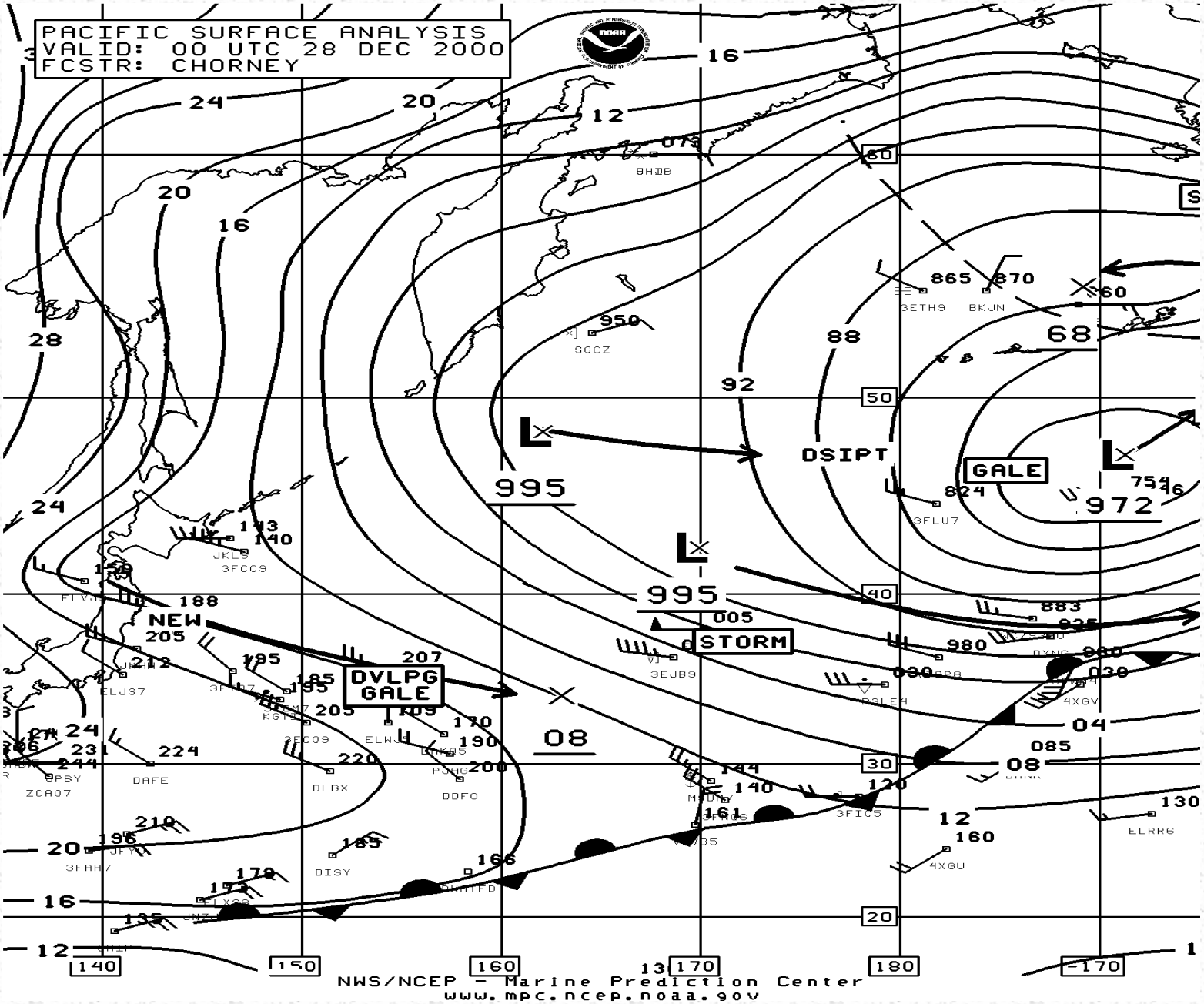
The surface analyses are generated four times per day (00Z, 06Z, 12Z, and 18Z) for each ocean. The analyses consist of isobaric pressure analyses at 4 mb contour interval spacing, labeled every 8 MB. The central pressure mb values of low and high pressure systems are depicted in bold 3 or 4 digits and underlined and placed adjacent to or under the "H" or "L". The surface analyses also consist of abbreviated automated ship plots of wind direction (8 points on the compass rose), wind speed (in knots) and present reported weather (using current standard symbols). The product is issued in two

parts, which overlap by some 10 degrees of longitude. Both parts will project the low or high pressure system's forecast position by drawing an arrow to the 24-hour position labeled as an "X" for lows and a circle with an "X" in the middle for highs with a bold two digit millibar central pressure value underlined under or adjacent to the 24-hour position label (e.g.,1050 mb high would be written as a 50 and a 960 mb low would have 60). Significant weather systems have labels depicting whether the system has "gale" or "storm" conditions as observed by ship and buoy observations, Special Sensor Microwave Imagery (SSM/I), QuikSCAT, satellite, or computer model guidance. If 36 hour forecast gale or storm conditions are expected, the appropriate area has the label "developing gale" or "developing storm". The surface analyses have been doubled in size and issued as a two part product (00Z Pacific Part 1, Part 2; 12Z Atlantic Part 1, Part 2) to allow the mariner to use the surface analyses as a work chart.

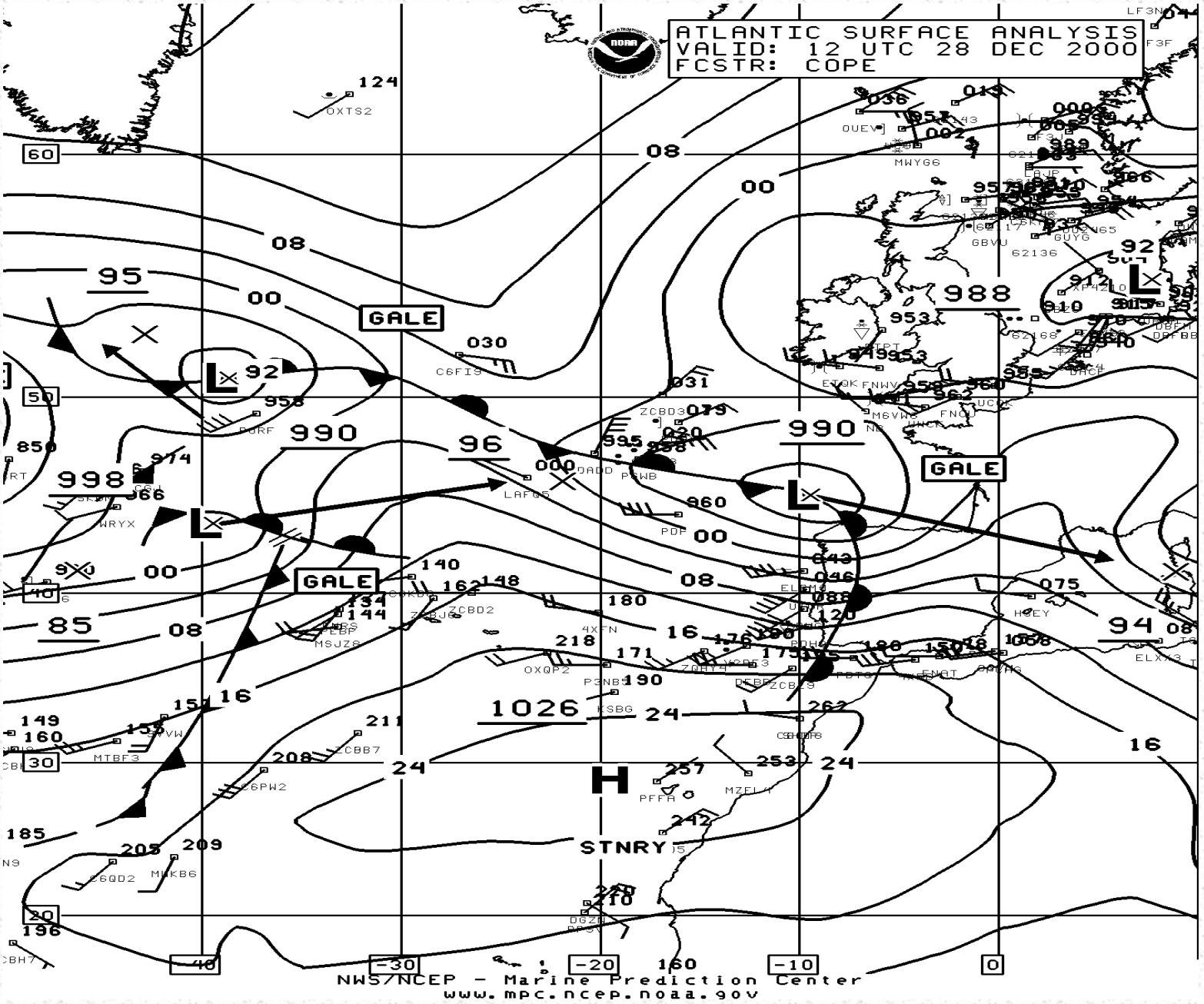
00Z Pacific Part 1



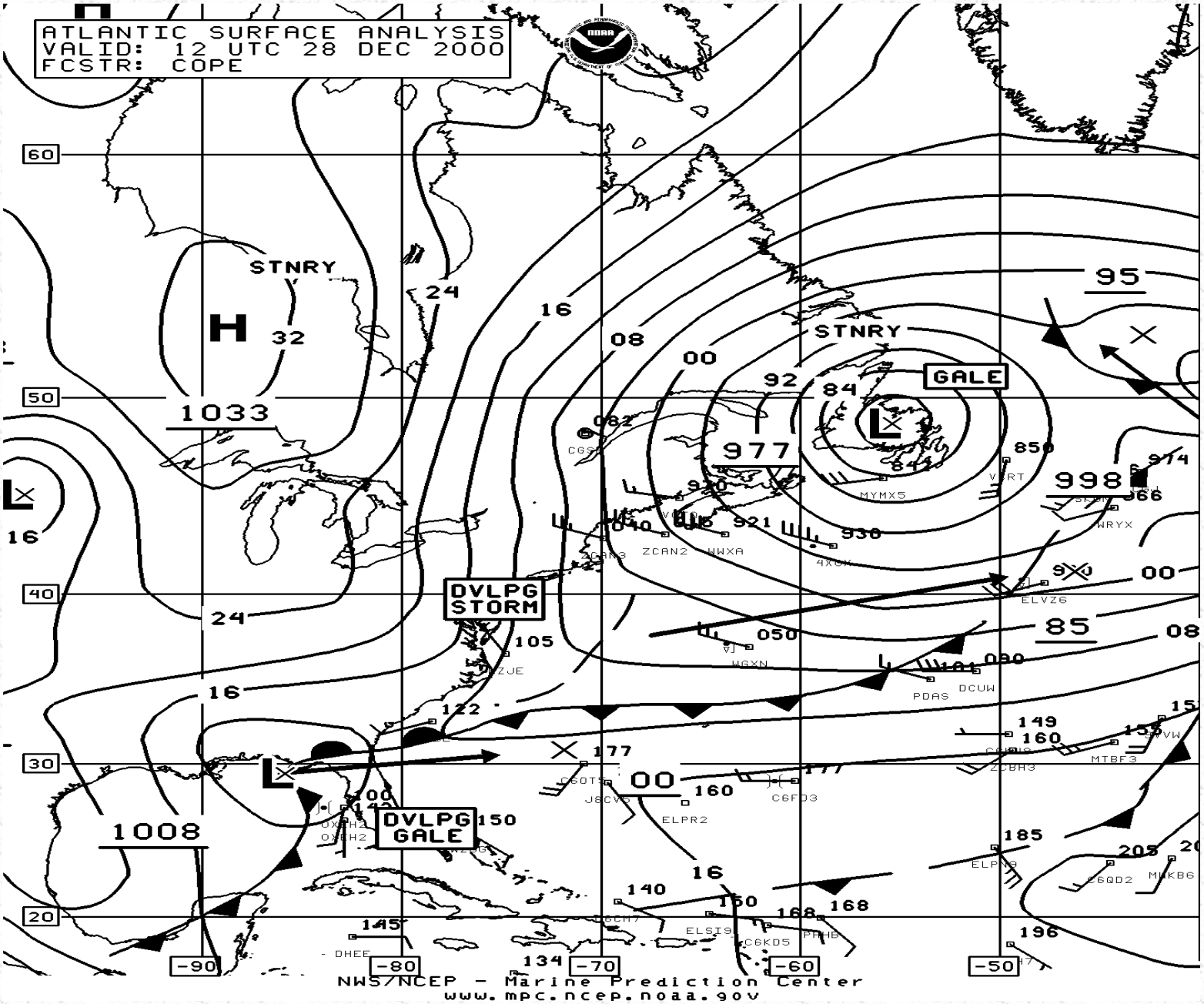
00Z Pacific Part 2



12Z Atlantic Part 1

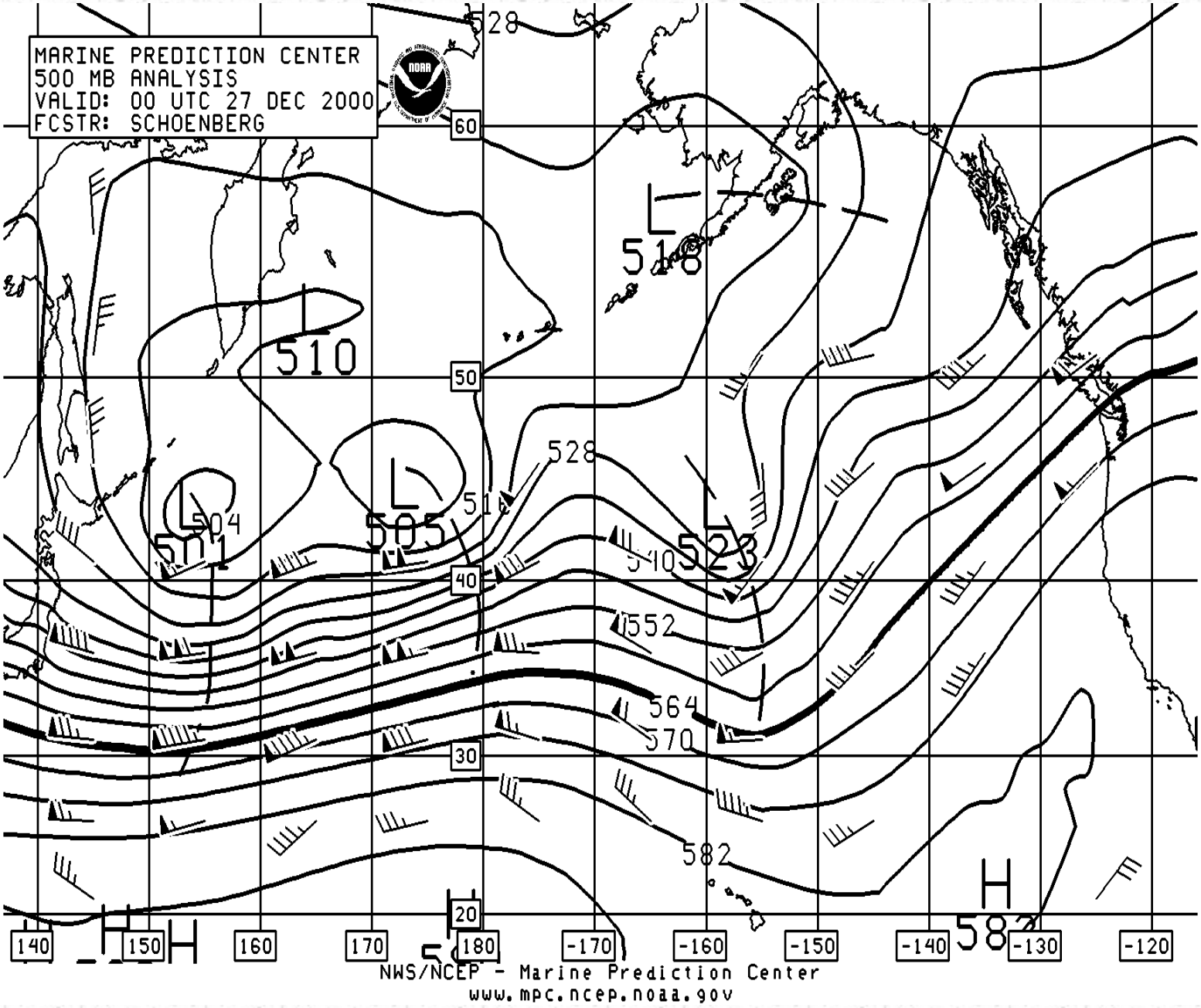


12Z Atlantic Part 2

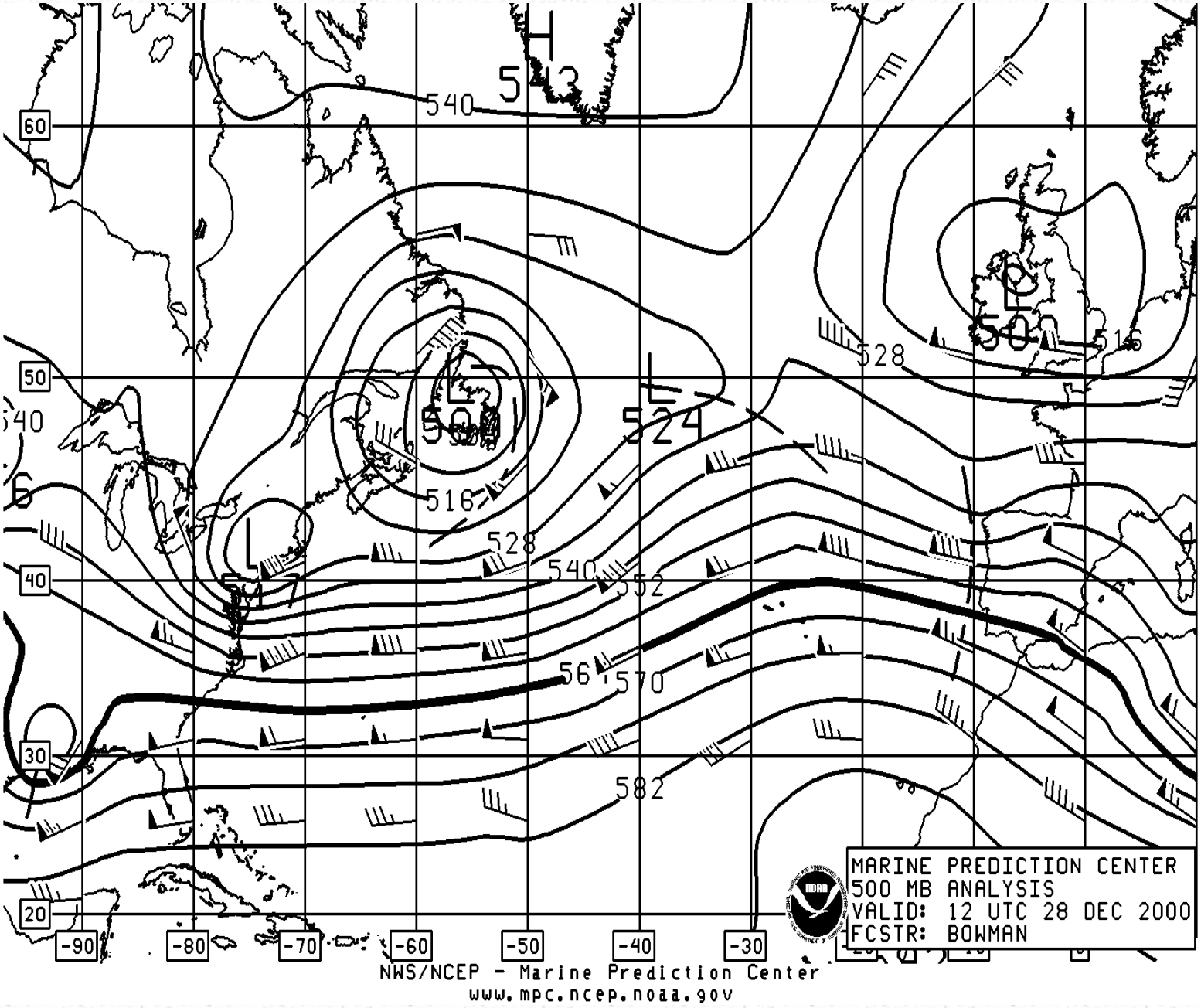


The mariner can also have the option to use the appropriate Parts 1 or 2 if operating only in that part of the ocean which will impact the vessel. The mariner can also compare the ship's current barometric pressure reading and Beaufort Wind Scale force conditions or anemometer readout of winds observed at the vessel to determine the product's validity. Mariners can then make their own inferences on how specific weather systems will impact their vessels. Used in conjunction with a 500 mb analysis (00Z Pacific, 12Z Atlantic), the 24 hour forecast position of synoptic scale weather systems will aid in determining a weather system's motion and intensity trends, thus extending the usefulness of the product. The surface analyses will also be broadcast in a very timely manner, less than 3 1/2 hours from the valid synoptic time. This product is an important tool that can substantially aid in the independent decision making process for crew safety, protection of the ship, prevention of cargo damage, and maintaining schedules.

00Z Pacific



12Z Atlantic

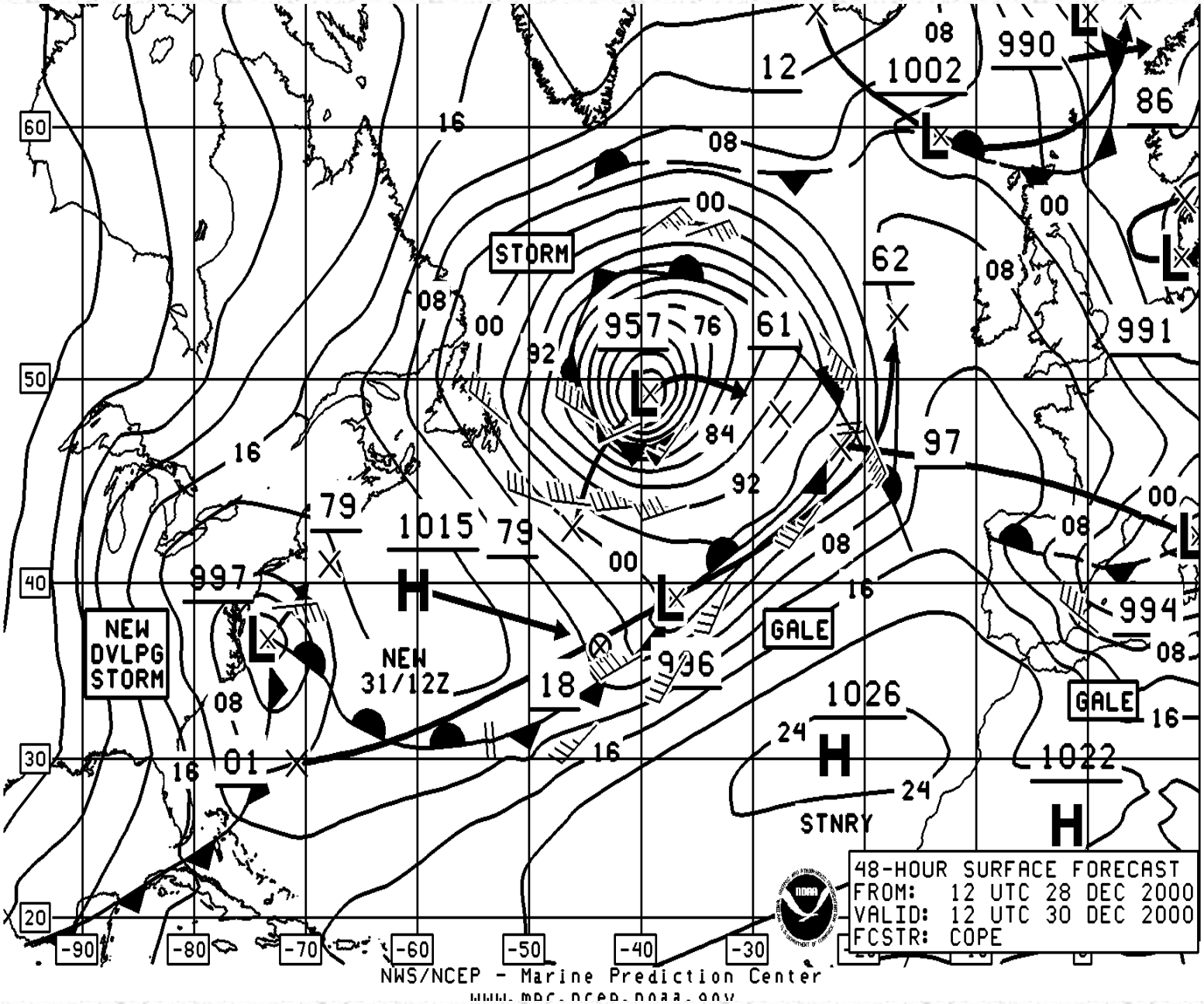


48-Hour Surface Forecasts

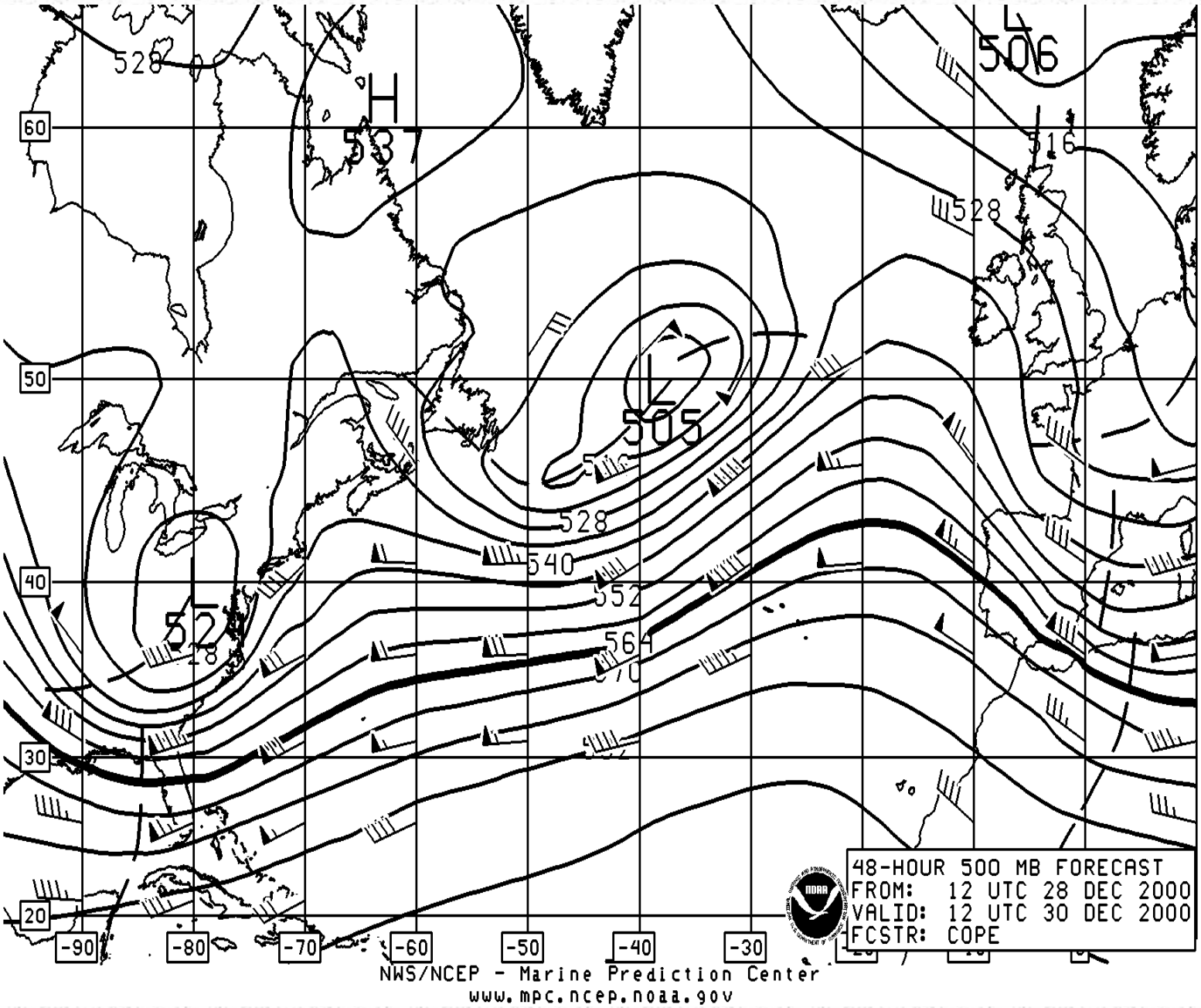
These surface forecast products generated twice each day at 00Z and 12Z for each ocean based on the 00Z and 12Z AVN forecast model run outputs with additional guidance from other government agencies such as the NAVYs Navy Operational Global Atmospheric Prediction System (NOGAPS). Also, other foreign goverments numerical model guidance is used such as the Canadian Regional Model. The use of several numerical models allows adjustments to be made to the final forecast product. The products show surface isobars every 4 mb with labeling of 2 digits in increments of 8 mb. The central pressure millibar values of synoptic scale lows and highs in bold 3 or 4 digits are underlined adjacent to or under the "L" or "H". The 24-hour forecast position and future 72-hour forecast position of lows and highs have vector arrows with an "X" for low centers and a "circle with an X inside" by the head for high centers. An underlined bold two digit mb central pressure value will

be placed under or adjacent to the 24/72 hour position label (e.g.,1050 mb high would be written as a 50 and a 960 mb low would have 60). The 48-hour surface forecast depicts wind speeds in knots (wind barbs in increments of 5 or 10 knots) for areas of wind in excess of 33 knots, and frontal systems (occluded, warm, and cold). Significant systems have labels depicting whether the system is expected to have "gale" or "storm" conditions. If 72 hour forecast gale or storm conditions are expected, the appropriate area has the label "developing gale" or "developing storm". The very timely issuance of the 48-hour surface forecasts (12Z Atlantic 48-Hr Surface Forecast), when used in conjunction with the 48-hour 500 mb and sea state forecast products (Atlantic 48-Hr 12Z 500 mb and 48-Hr 12Z Wind/Wave), can help vessels make course and speed adjustments to avoid the heaviest forecast wind and wave conditions or minimize the ship's exposure to heavy weather. The tracking history and forecast projection of highs and low from 24 hours through 72 hours will serve to extend the time usage of the product, thus aiding a vessel's Master in the determination of crew safety, minimizing ship or cargo damage, fuel economy, and maintaining schedules.

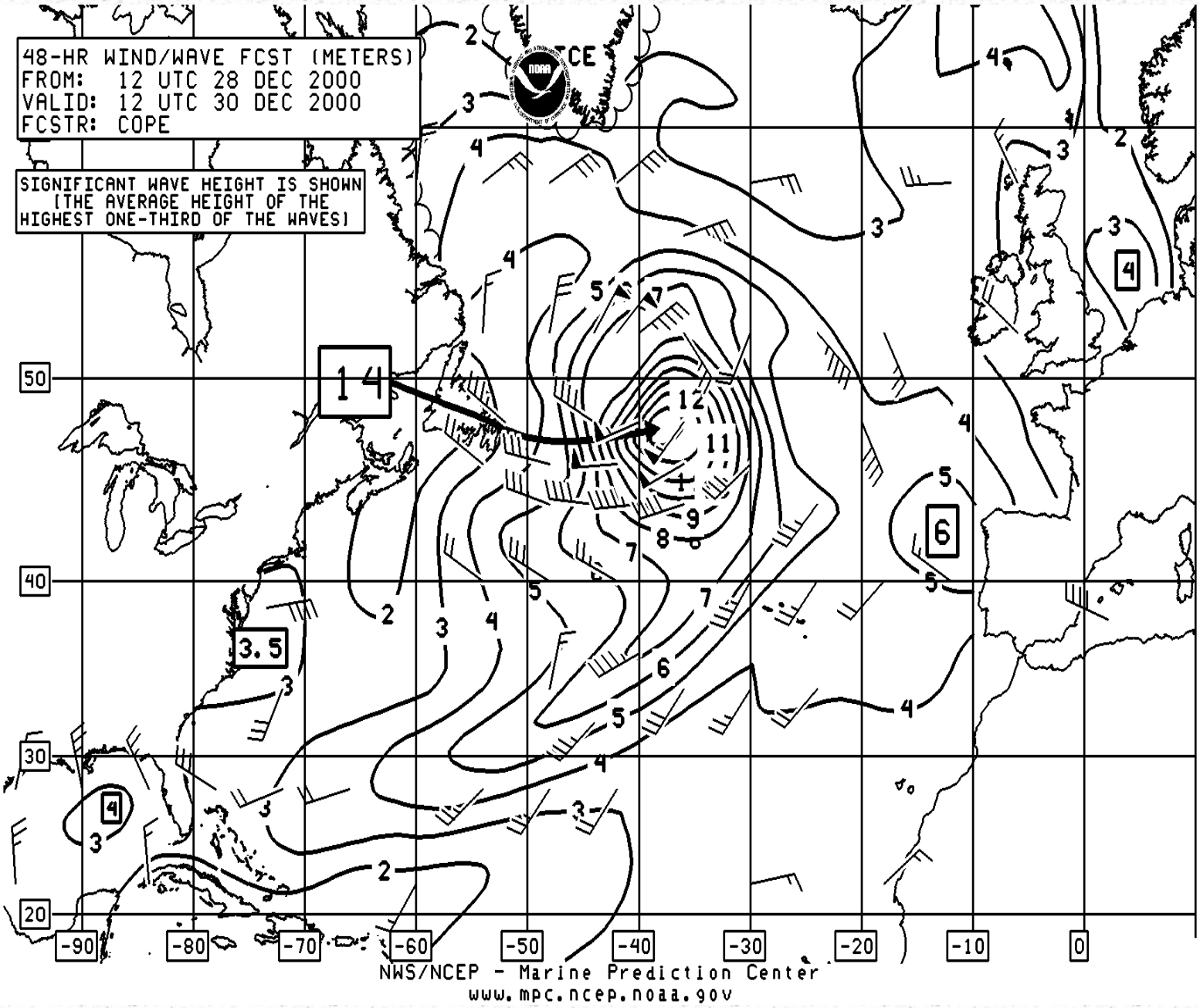
12Z Atlantic 48-Hour Surface Forecast



Atlantic 48-Hour 12Z 500-mb Forecast



48-Hour 12Z Wind / Wave

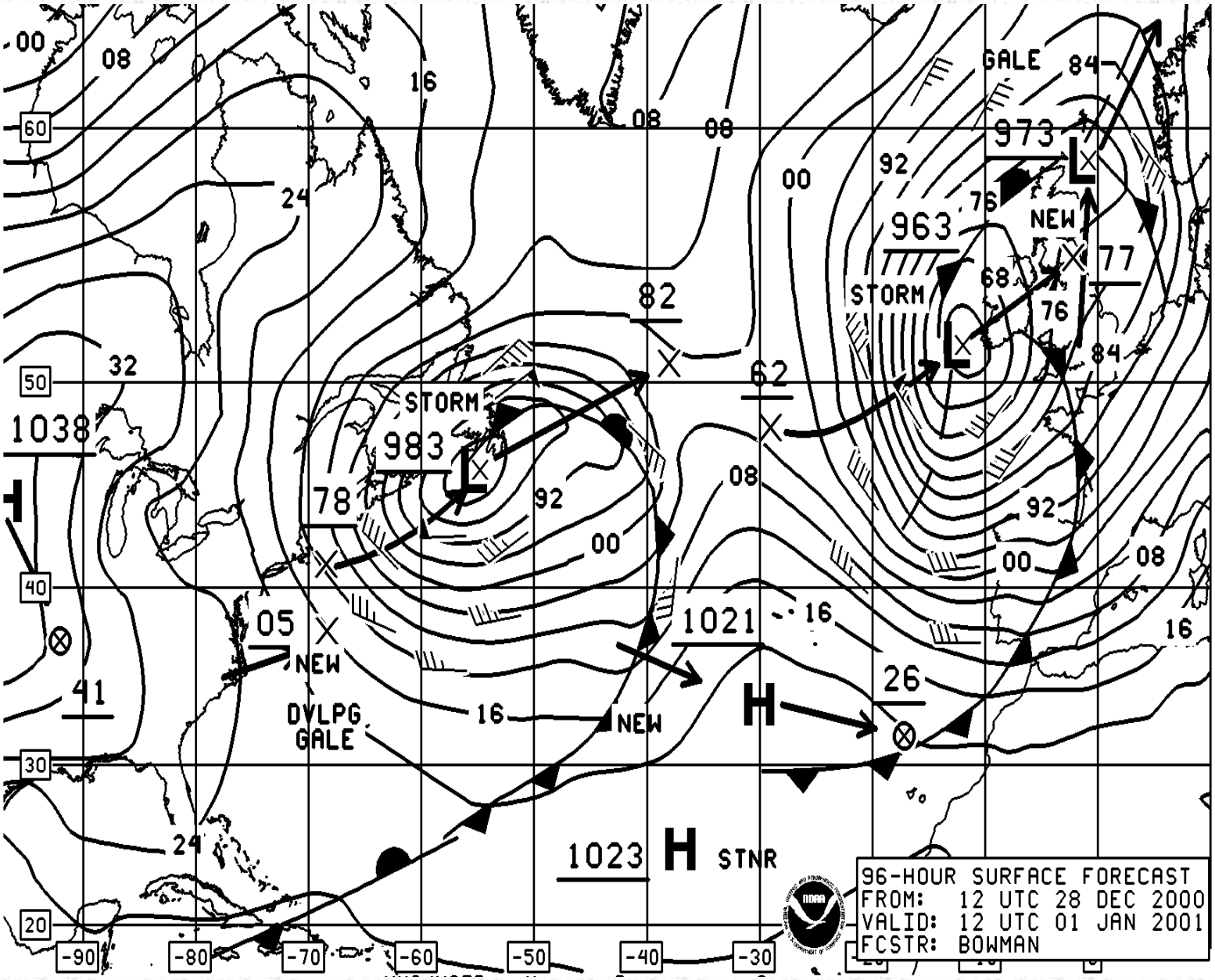


96-Hour Surface Forecasts

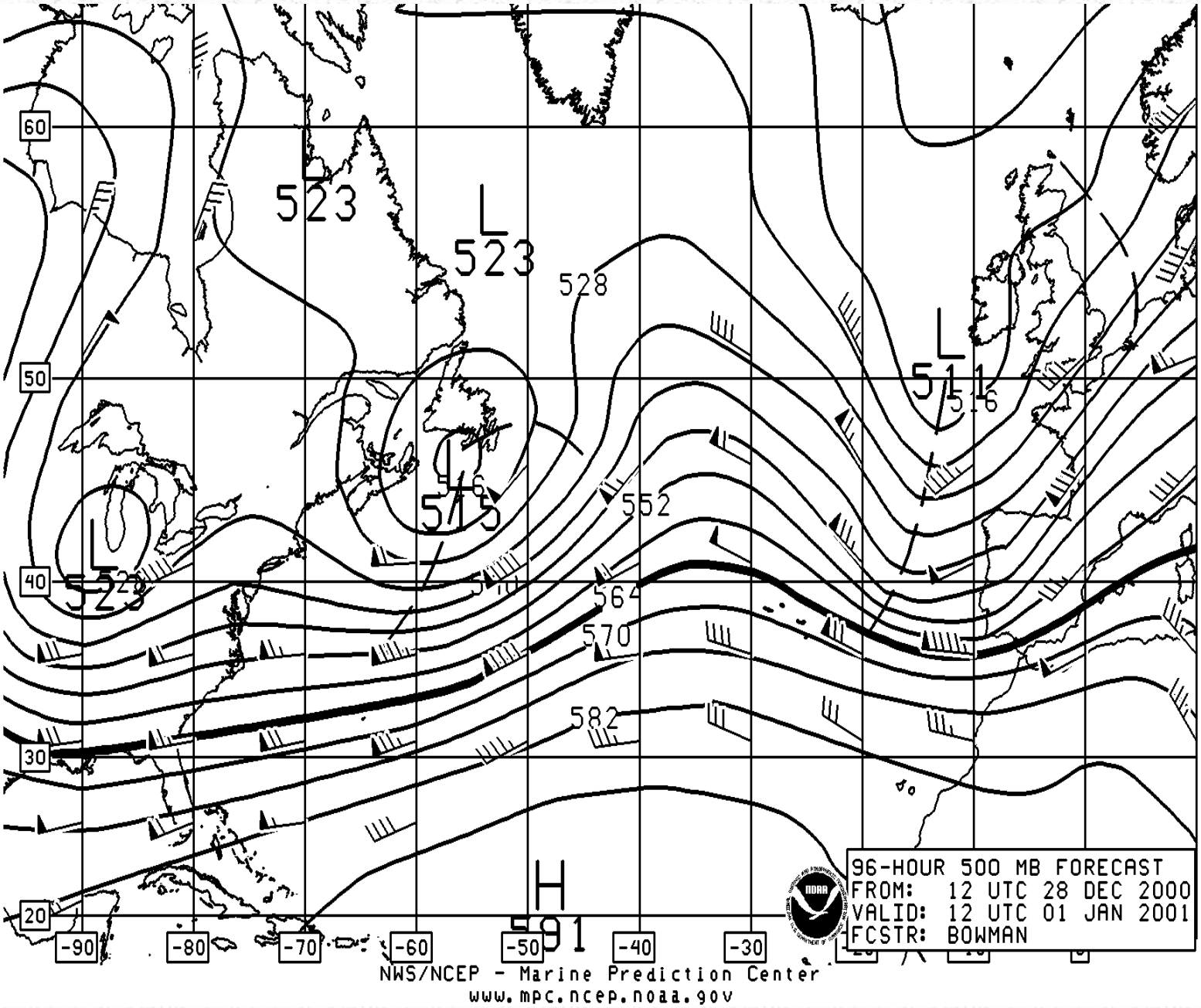
These extended surface forecast products are generated once each day. The product is based on the 00Z Medium Range Forecast (MRF) model for each ocean with additional guidance from other government agencies such as the NAVYs Navy Operational Global Atmospheric Prediction System (NOGAPS). Also, other foreign goverments numerical model guidance is used such as the European Center for Medium Range Weather Forecasts (ECMWF) and Canadian Regional Model. The use of several numerical models allows adjustments to be made to the final forecast product. The products show surface isobars every 4 mb with labeling of 2 digits in increments of 8 mb. The central pressure millibar values of synoptic scale lows and highs in bold 3 or 4 digits are underlined adjacent to or under the "L" or "H". The 72-hour forecast position and future 120-hour forecast position of lows and highs have vector arrows with an "X" for low centers and a "circle with an X inside" by the head for high centers. An underlined bold two digit mb central pressure value will be placed under or adjacent to the 72/120 hour position label (e.g.,1030 mb high would be written as a 30 and a 980 mb

low would have 80). The 96-hour surface forecast depicts wind speeds in knots greater than or equal to 34 kt (wind barbs in increments of 5 or 10 knots), and frontal systems (occluded, warm, and cold). Significant systems have labels depicting whether the system is expected to have "gale" or "storm" conditions. If by 120 hours forecast gale or storm conditions are expected, the appropriate area has the label "developing gale" or "developing storm". If a tropical system such as a hurricane or typhoon is anticipated the 96-hour position will be indicated as a "Low" with the pressure as "XXX" for an unknown pressure. The 72-hour position will correspond to the latest official forecast from the responsible Typhoon Warning Center in the Pacific or the National Hurricane Center in Miami, Florida. The 120-hour forecast position corresponds to Marine forecasters estimated position. The issuance of the 96-hour surface forecasts (Atlantic 96 Hr 00Z Surface Forecast), when used in conjunction with the 96-hour 500 mb(Atlantic 96 Hr 00Z 500 mb), can help vessels make course and speed adjustments to avoid the heaviest forecast wind conditions or minimize the ship's exposure to heavy weather. The tracking history and forecast projection of highs and lows from 72 hours through 120 hours will serve to extend the time usage of the product.

Atlantic 96-Hour 00Z Surface Forcast



Atlantic 96-Hour 00Z 500-mb



Sea State Products

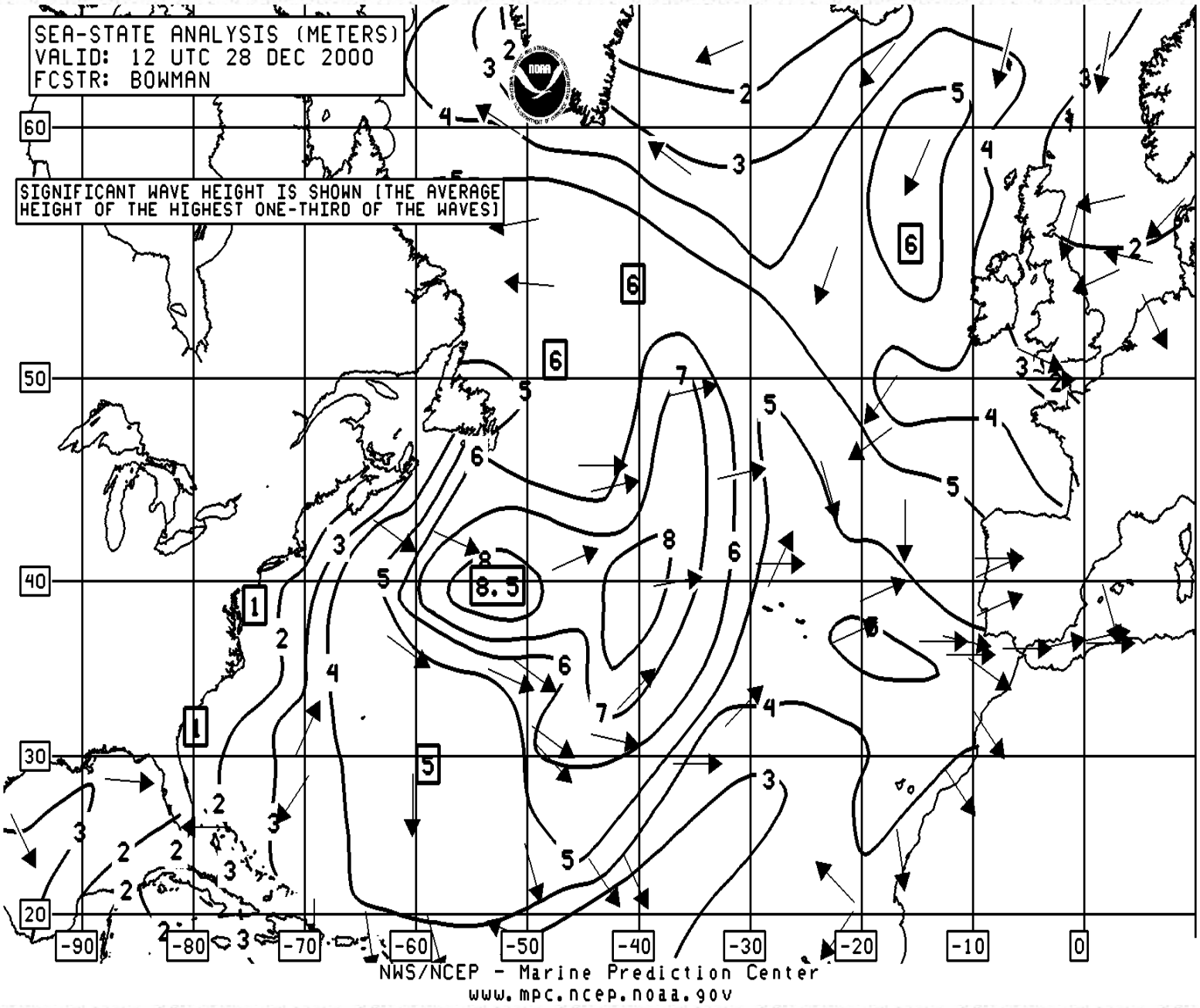
One of the greatest hazards to a vessel's safety and seakeeping capability is having to maneuver around and through changeable sea state conditions. Masters have the awesome responsibility to make transoceanic crossings with crew safety the highest in priority and then ensuring that the ship and its valuable cargo arrive at destination ports safely while meeting tight schedules. The duration of adverse or slowing seas must be minimized since turn around time in each port is usually less than 24 hours. MPC issues one sea state analysis for both the Atlantic and Pacific oceans on a daily basis. The MPC issues two 48-Hour Wind/Wave Forecasts and one 96-Hour Wind/Wave Forecast each day. In

addition two 48-Hour Period Forecasts and one 96-Hour Period Forecast are prepared each day. During the winter cold season, the ice edge is depicted as a bold jagged line. The contours for these products is in one meter intervals with a relative maximum and minimum combined wave height values centrally displayed and inside a box. Forecast of all wind speeds is also depicted. The sea state forecast when viewed with the 48-hour surface forecasts will help vessels make course and speed adjustments to avoid hazardous conditions and minimize exposure to slowing conditions.

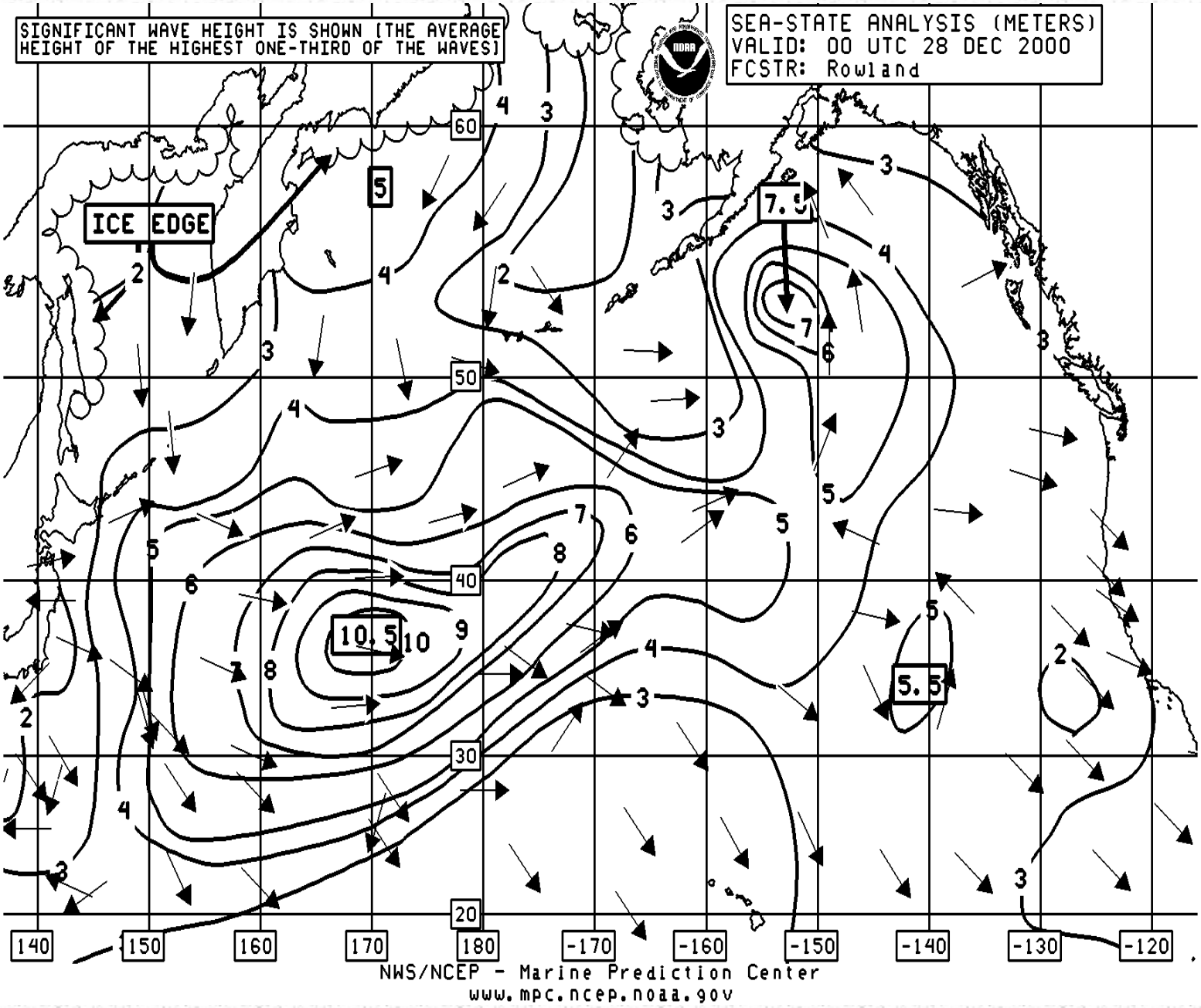
Sea State Analysis

This product is once a day per ocean at 00Z for the North Pacific and 12Z for the North Atlantic (example, 12Z Atlantic and 00Z Pacific Ocean) with analysis of ship synoptic reports and automated weather stations such as CMANs for sea state in "meters". The sea state analysis is prepared for each ocean at the time of day when the greatest quantity of observations are taken. The sea state analysis has solid 1 meter contour intervals. Where appropriate, relative maxima and minima combined wave height values (approximately 1/3 the height of the wind wave added to the height of the swell wave) are centrally depicted and inside a box under or adjacent to the wave height value. To produce the final analysis ships and buoys reporting data along with the NCEP and Navy significant wave forecast models are used for guidance in areas of sparse data and are used to verify model guidance. The sea state analyses highlight where the most significant combined sea states prevail. Primary swell direction arrows are also depicted. When viewed together with the surface analyses, the user should have a complete picture of surface weather conditions in a very timely manner, thus substantially aiding the mariner in crew safety and the protection of property.

12Z Atlantic Ocean



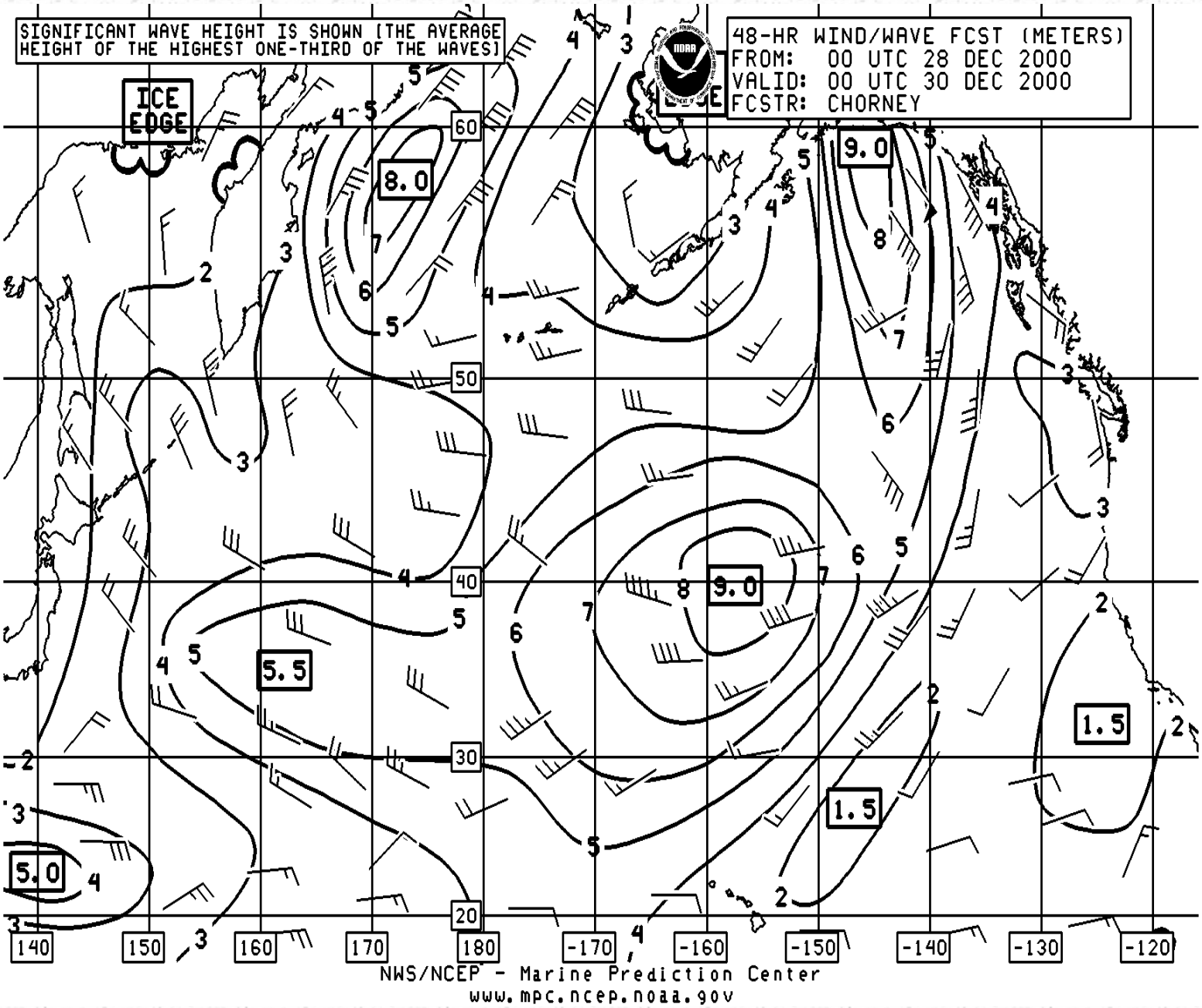
00Z Pacific Ocean



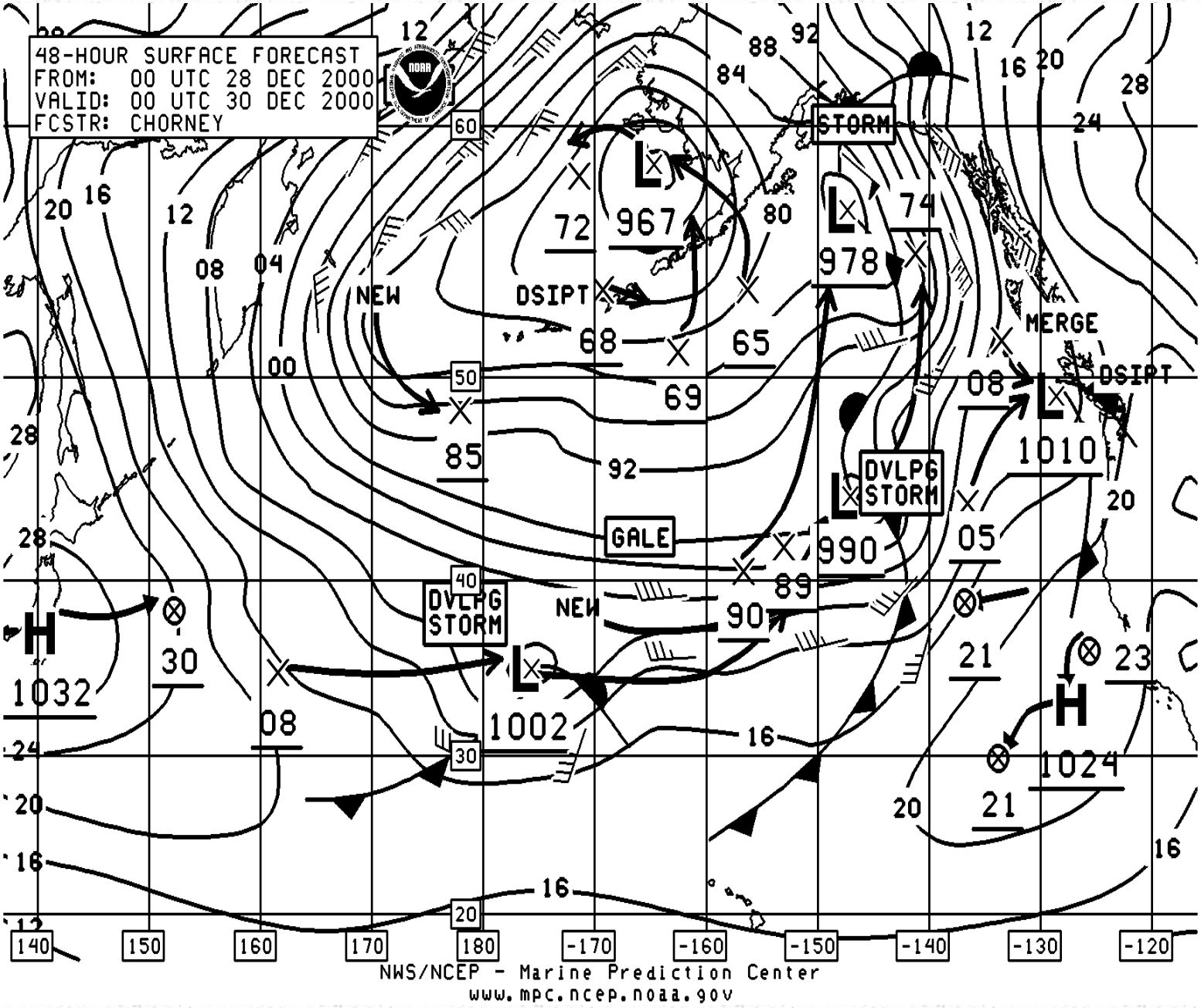
48-Hour Wind/Wave Forecast

These forecast products are generated twice daily. The forecasts valid at 00Z and 12Z are based on the significant wave forecast model runs from NCEP and the Navy. The combined sea heights are depicted in solid contours of one meter increments with relative maxima or minima combined sea state values enclosed inside a box under or adjacent to the area of interest. Also, the ice edge is displayed as a bold jagged line during the winter months. These products will provide a complete picture of forecast surface conditions when used in conjunction with the 48-hour surface forecasts (00Z Pacific 48-Hour Wind/Wave, 48-Hour Surface Forecast). The 48-hour wind/wave forecasts highlight where the most significant combined sea heights prevail. Also, forecast wind speed in knots are plotted on this chart.The wind/wave forecasts products are issued in a timely manner and will significantly aid in the independent decision-making process of heavy weather avoidance, thus aiding vessels in minimizing the duration of encounter of slowing or potentially damaging conditions.

00Z Pacific Wind / Wave



48-Hour Surface Forecast



48-Hour and 96-Hour Wave Period Forecast

Computer generated chart which is generated twice a day from the 00Z and 12Z computer model runs. The 48-hour graphic is manually edited (00Z Pacific 48-Hour Wave Period Forecast) while the 96-hour graphic is produced directly from computer output with no manual editing. The 96-hour graphic is an experimental product. Depending on user feedback, the MPC may implement the 96-hour product operationally on December 20, 2000. Customers can send comments to:

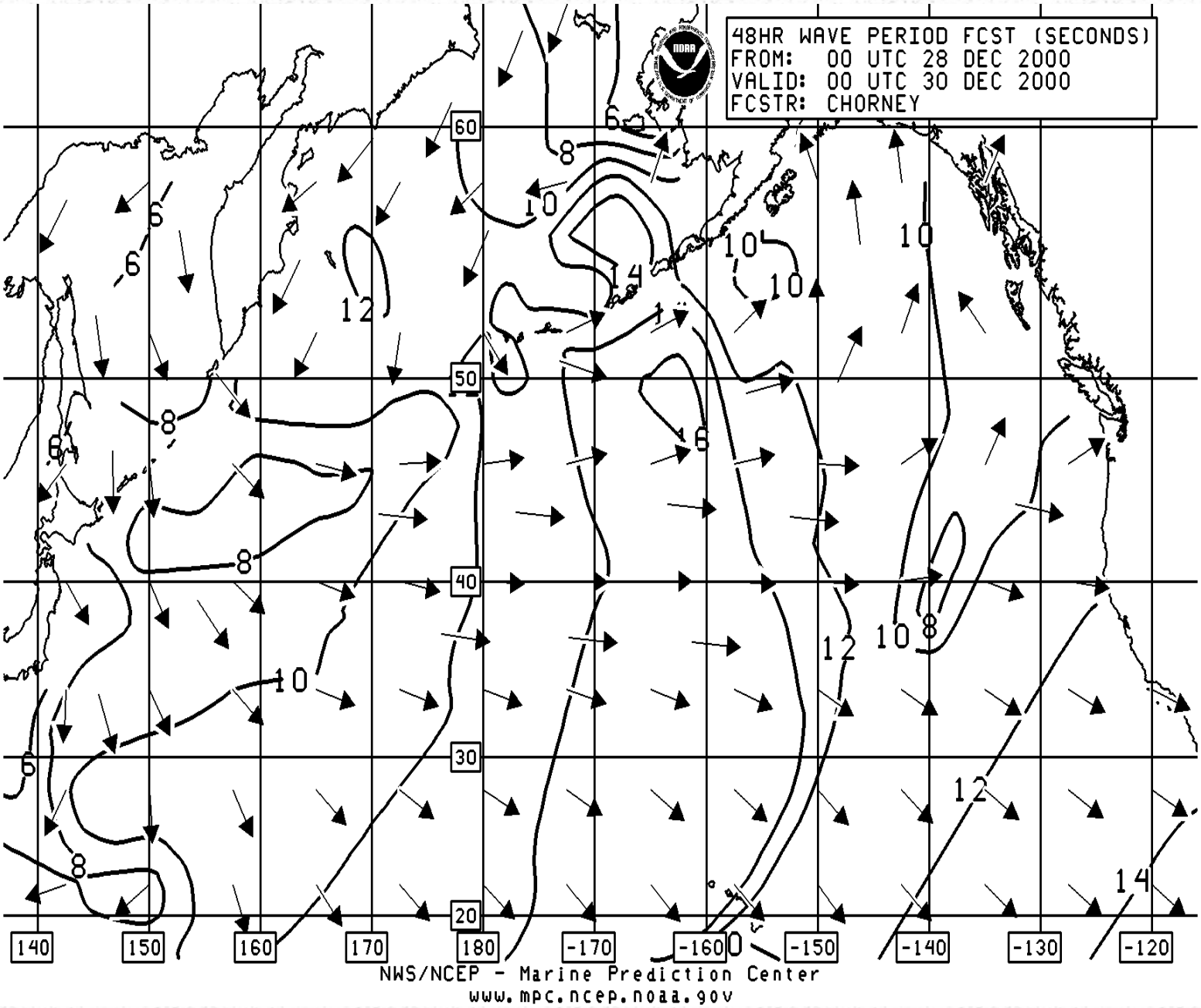
National Weather Service
National Centers for Environmental Prediction
Marine Prediction Center
World Weather Building 5200 Auth Road, Room 410G
Camp Springs, M.D. 20746

Attn: David Feit, Branch Chief, Marine Forecast Branch, W/NP41

or

Email:David.Feit@noaa.gov

00Z Pacific 48-Hour Wave Period Forecast



The forecast relies on guidance from the WaveWATCH III with forecasts for the Atlantic and Pacific Oceans. The peak period identifies either the locally generated `wind sea' (in cases with strong local winds) or the dominant wave system (`swell') that is generated elsewhere. Note that the peak period field shows discontinuities. These discontinuities can loosely be interpreted as swell fronts, although in reality many swell systems overlap at most locations and times. A swell front is the leading edge of wave periods with higher energy which typically originates and moves away from a storm center. Arrows on the forecast graphic point toward the prevailing swell direction.

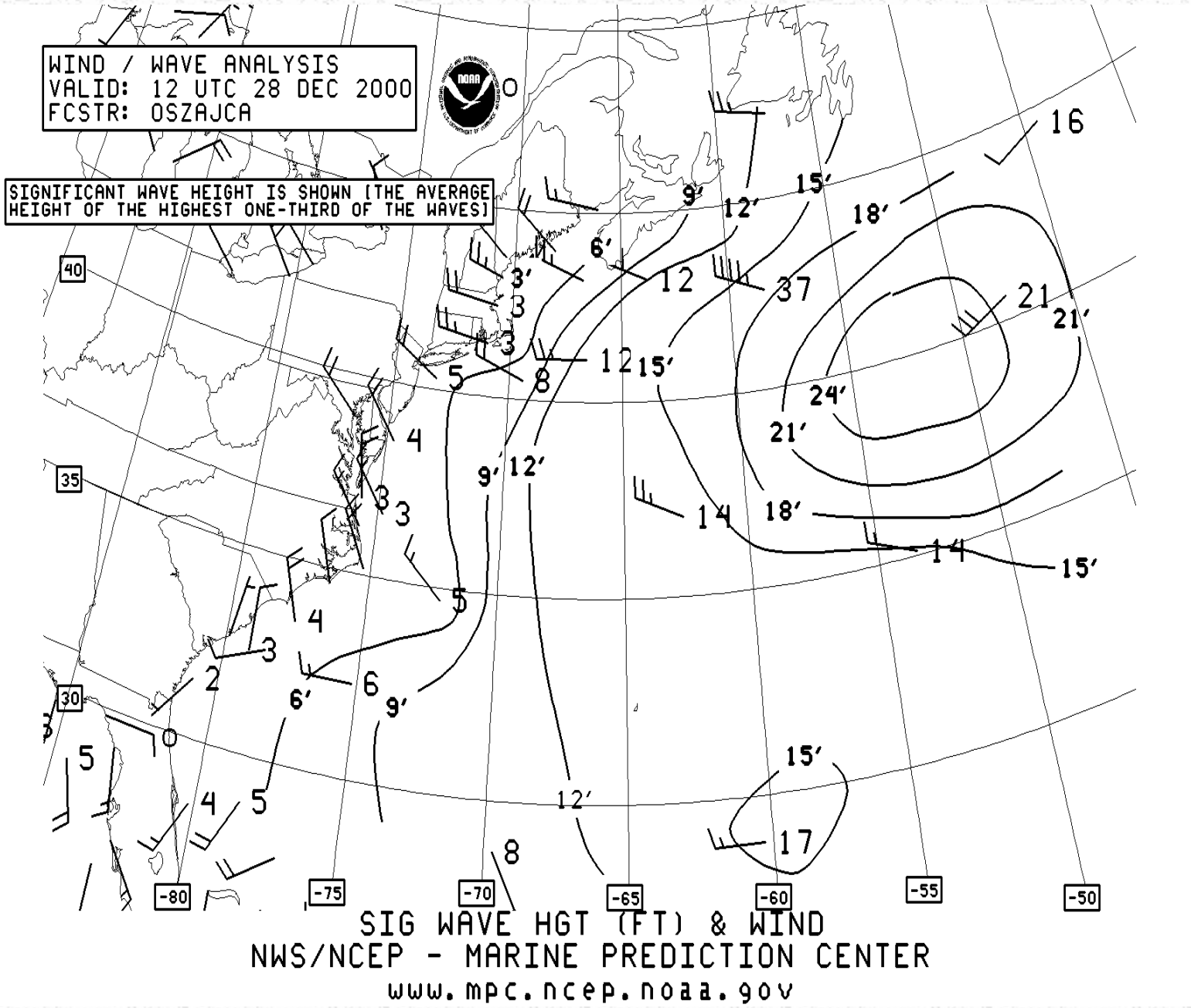
Regional Products

Regional surface graphic products target coastal, offshore and high-seas users. These products produced on polar stereographic map backgrounds encompass the western Atlantic Ocean west of 50W and north of 30N, including the US east coast and the central Florida coast. Also covered is the eastern North Pacific Ocean, from the Baja peninsula, south to Cabo San Lucas, and north to the Gulf of Alaska, including Prince William Sound as far west as 150W. The regional products consist of the 00Z and 12Z sea state analysis and 24-hour forecasts of the surface and wind/wave. The Marine Prediction Center issues the regional sea state analysis and forecast products twice daily per ocean for 00Z and 12Z. The sea state analysis shows ship observations with observed winds (knot) and sea state in feet. The short range forecast products depict synoptic and mesoscale features of surface low and high pressure systems and isobars with frontal features, areas of reduced visibility, wind speeds, and significant wave height as generated by the synoptic and mesoscale weather systems within 1000 miles of the U.S. east and west coasts. The process of product preparation includes using wind speeds derived from Special Sensor Microwave Imagery (SSM/I), and QuikSCAT received from polar orbiting satellite from oceanic areas. This high state of the art technology of data input represents a significant enhancement in analyzing wind conditions in the marine environment. SSM/I and QuikSCAT is especially noteworthy in data sparse areas where there are no ship or buoy reports. SSM/I and QuikSCAT aids in short range prediction of the 24-hour forecast products by enabling marine meteorologists to compare initial data from forecast model output and making the necessary adjustments to the near term forecast solutions.

Regional Sea State Analysis

This product is issued every three hours and is broadcast on the radiofacsimile program twice a day per ocean at 00Z and 12Z (example, 12Z Atlantic) with analysis of ship synoptic reports and automated weather stations such as CMANs for sea state in "feet"and observed windspeed (knot). The sea state analysis has solid three foot contour intervals. Where appropriate, relative maxima and minima combined wave height values (approximately 1/3 the height of the wind wave added to the height of the swell wave) are centrally depicted and inside a box with the maximum or minimum values. To produce the final analysis ships and buoys reporting data along with the NCEP and Navy significant wave forecast models are used for guidance in areas of sparse data and are used to verify model guidance. The sea state analyses highlight where the most significant combined sea states prevail. When viewed together with the surface analyses, the user will have a complete picture of surface weather conditions in a very timely manner, thus substantially aiding the mariner in crew safety and the protection of property.

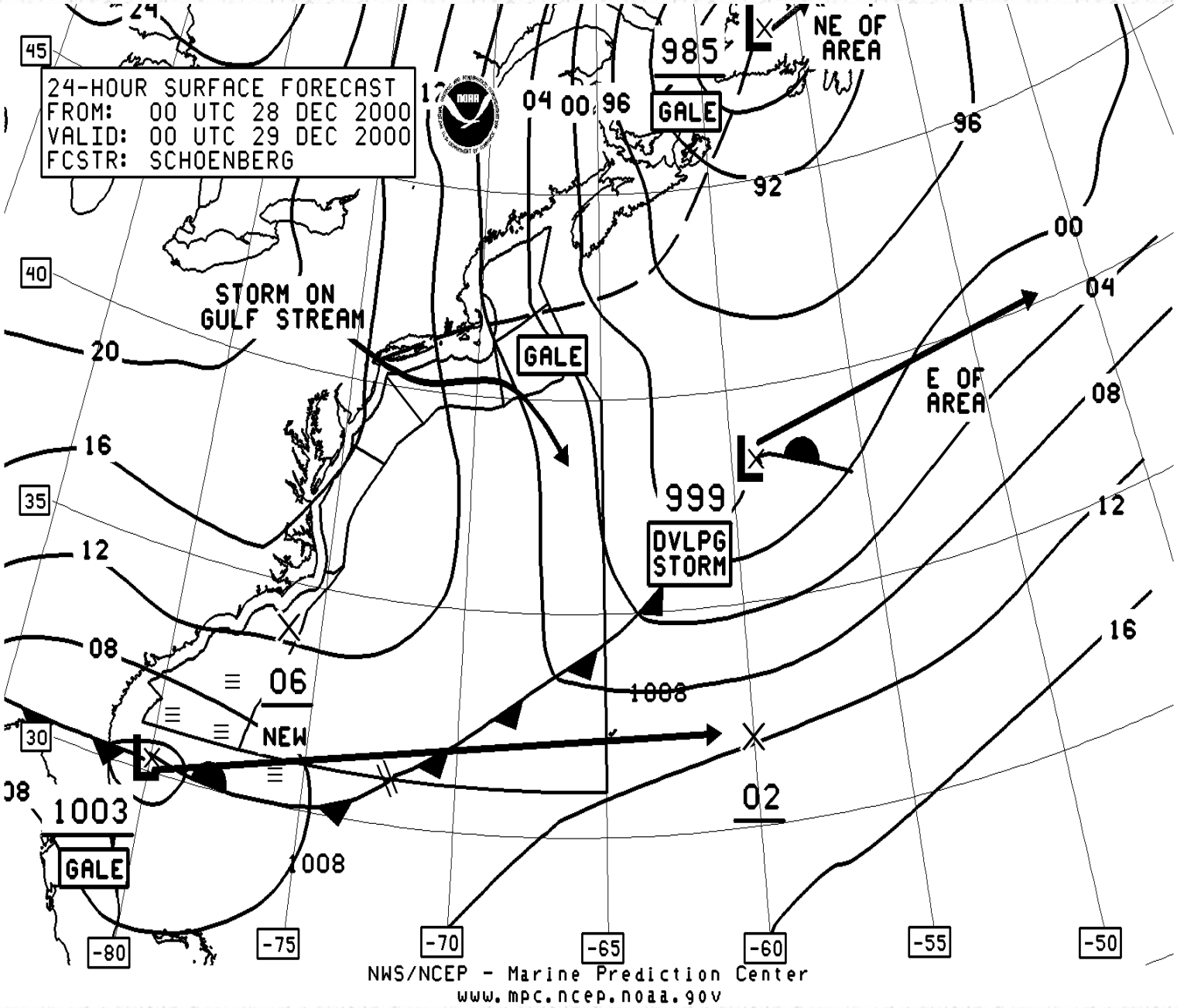
12Z Atlantic



Regional 24-Hour Surface Forecast

This product is a surface forecast chart featuring low and high pressure center positions with bold 3-and 4-digit central pressure values underlined under or adjacent to the "L" or "H" (00Z Atlantic 24-Hour Surface Forecast). An arrow points to the 48-hour forecast position of lows and highs with an "X" for low centers and a "circle with an X inside" by the head for high centers. Significant systems have labels depicting whether the system is expected to have gale or storm conditions. If 24 hour forecast "gale" or "storm" conditions are expected the system the system is labelled with the appropriate warning. If "gale" or "storm" conditions are expected by 48 hours the appropriate area has the label "developing gale" or "developing storm". Also displayed on this surface forecast chart are frontal systems (occluded, warm, and cold) and when appropriate, associated areas of fog, signifying areas of potential restriction to visibility. The frontal systems themselves imply regions of visibility-reducing precipitation, which for the sake of clarity and brevity are not depicted. Isobars (lines of equal surface pressure) are depicted in increments of 4 mb except 8 mb for deep systems (i.e., 960 mb). The 1000 mb contour will be dashed to separate 4 mb from 8 mb contour spacing.

00Z Atlantic 24-Hour Surface Forecast

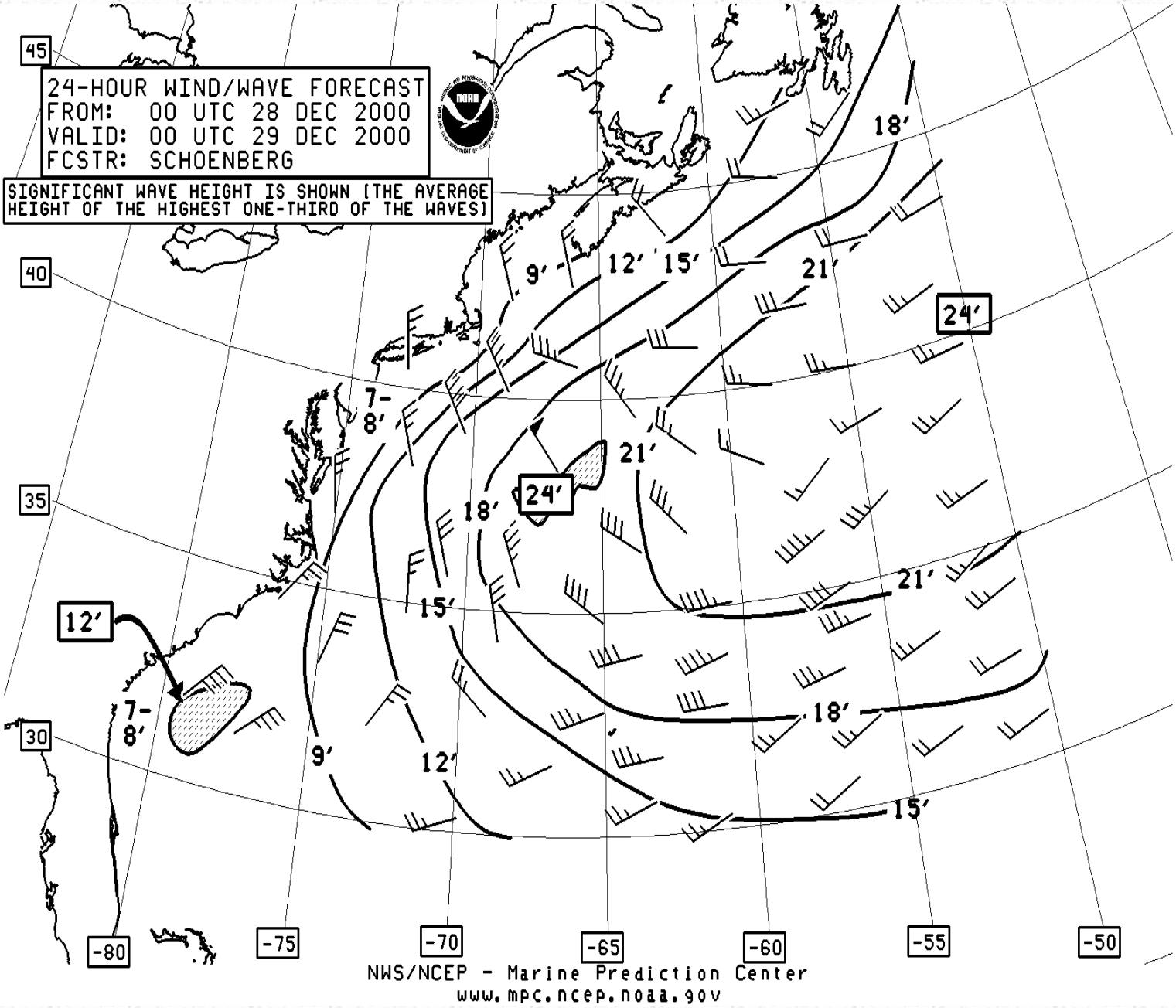


Regional 24-Hour Wind/Wave Forecast

This forecast product depicts 24-hour forecasts (00Z Atlantic 24-Hour Wind/Wave Forecast) of wind (increments of 5 knots) and significant wave heights (isopleths of combined sea and swell in 3 foot intervals). During appropriate weather conditions such as "North Wall" episodes occurring along the northern wall of the Gulf Stream in the western Atlantic, substantially higher wind/wave height values are highlighted. Arrows will point to a superimposed hatched area of the Gulf Stream. The "North Wall" event is normally confined to the adjacent areas of the northern edge of the Gulf Stream. Another item that may be highlighted on the forecast is "Swell fronts" which may originate from tropical systems. These "Swell fronts" can be hazardous conditions to marine operations and those in coastal areas. A scalloped line is used to depict the front and is labelled appropriately such as "SWELL FRONT FROM HURRICANE DEBBY" Arrows will be from the text to the leading edge of

the "Swell front" Forecast guidance to prepare this product are provided by wave height and wave period models from NCEP and the US Navy. The wave height values are depicted by solid contours in increments of three feet. Superstructure icing, displayed by a half moon with one or two lines crossing through the center, will depend on the forecast for light or heavy accumulation.

00Z Atlantic 24-Hour Wind / Wave Forecast

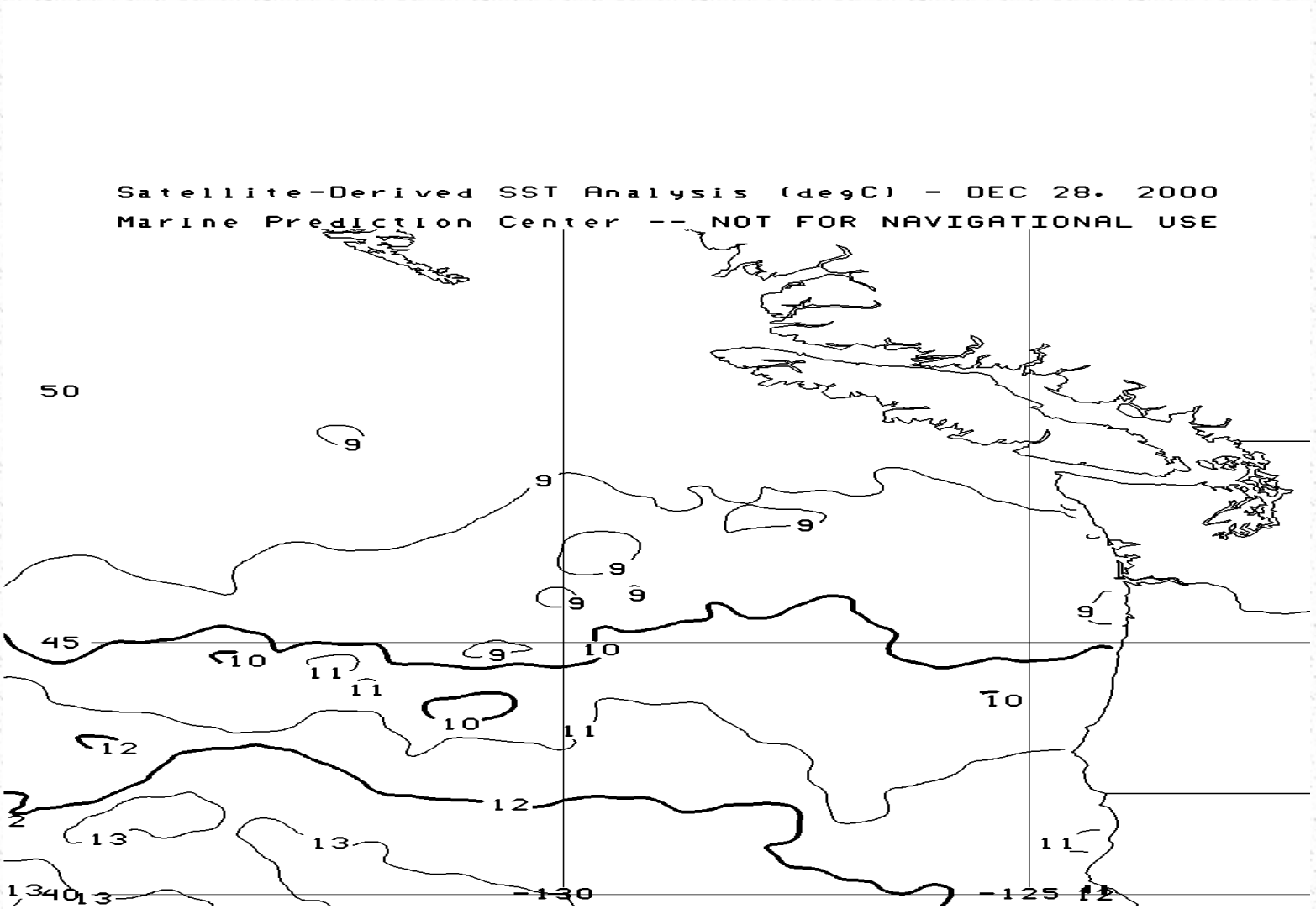


Oceanographic Products

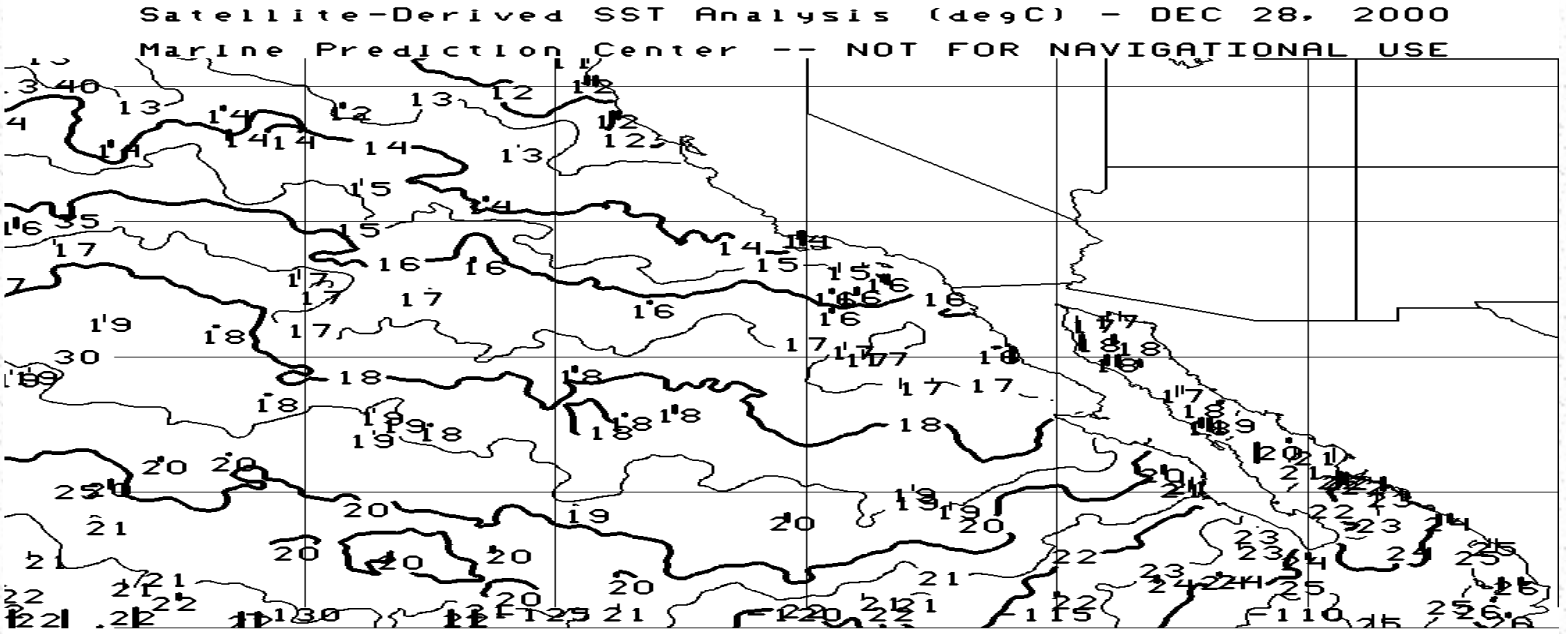
Oceanographic Operational Products-Sea Surface Temperature (SST)

There are two ocean charts available on the Pacific Radiofacsimile program. Each of the charts is updated once a day with automated Sea Surface Temperature (SST) analyses derived from (IR) Infrared Satellite. The northern chart includes the nearshore waters of Washington and Oregon as well as the coastal waters of Vancouver Island and Queen Charlotte Sound in Canada; SST Analysis (40N-53N, EAST OF 136W). The southern chart includes all of California, the Baja peninsula, and most of the coastal waters of western Mexico, south to near Puerto Vallarta; SST Analysis (23N-42N, EAST OF 136W).

Northern Chart



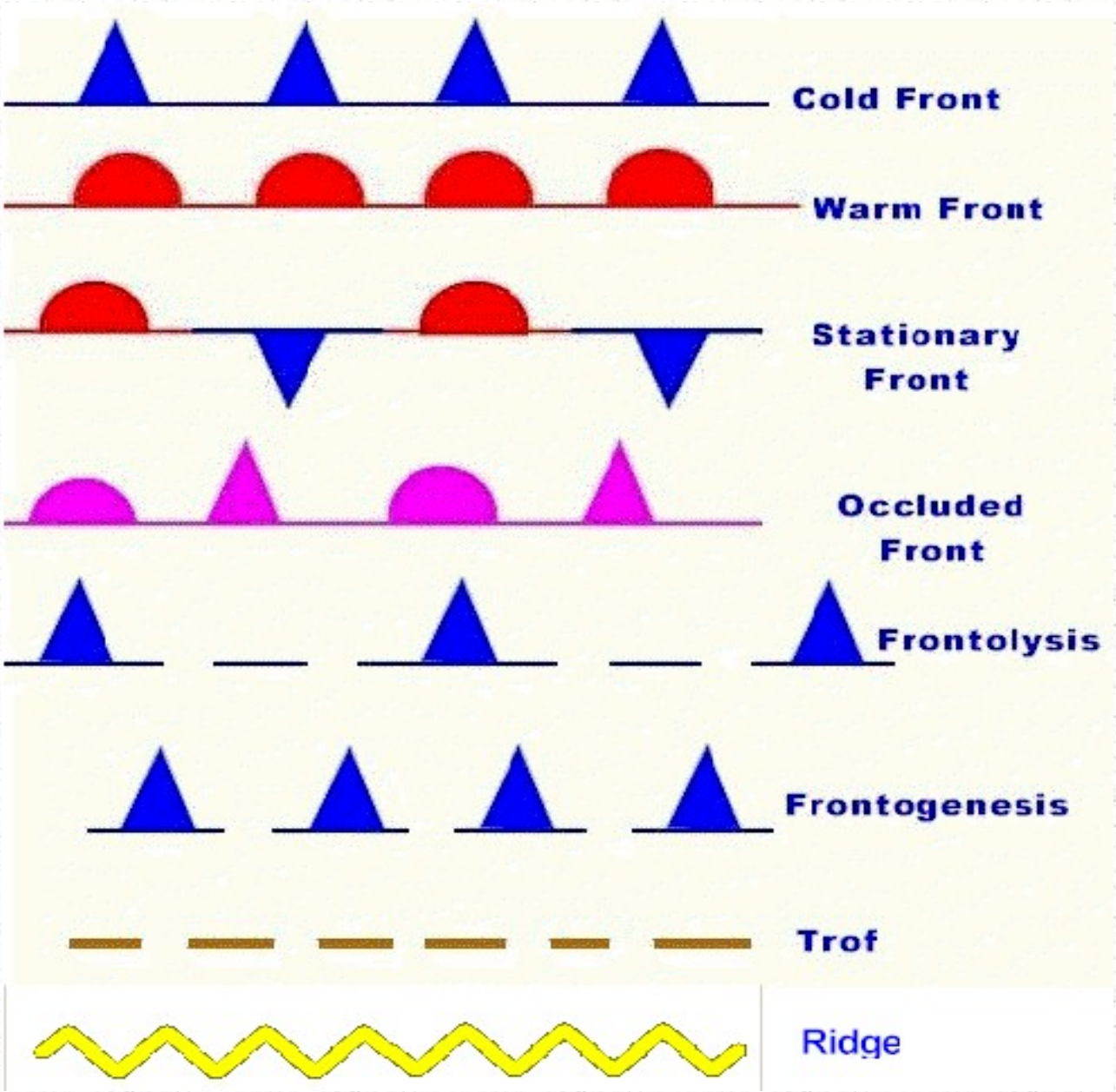
Southern Chart



NOTE: Like weather charts, oceanographic charts depict operational data that are part of the total data set of the National Oceanic and Atmospheric Administration. The charts reflect a basic analysis of the data to support safe and efficient operations in the marine environment. If these products do not meet their specific operational requirements, users should consult the private meteorological and oceanographic community for further assistance.

Key terms and Symbols

FRONTS



Cold front

-The leading edge of a relatively colder airmass which separates two air masses in which the gradients of temperature and moisture are maximized. In the northern hemisphere winds ahead of the front will be southwest and shift into the northwest with frontal passage.

Frontogenesis

-The formation of a front occurs when two adjacent air masses with different densities and temperatures meet and strengthen the discontinuity between the air masses. It occurs most frequently

over continental land areas such as over the Eastern US when the air mass moves out over the ocean. It is the opposite of frontolysis.

Frontolysis

-The weakening or dissipation of a front occurs when two adjacent air masses lose contrasting properties such as the density and temperature. It is the opposite of frontogenesis.

Occluded front

- The union of two fronts, formed as a cold front overtakes a warm front or quasi-stationary front refers to a cold front occlusion. When a warm front overtakes a cold front or quasi-stationary front the process is termed a warm front occlusion. These processes lead to the dissipation of the front in which there is no gradient in temperature and moisture.

Ridge

- an elongated area of relatively high pressure that is typically associated with a anticyclonic wind shift.

Stationary front

- A front that has not moved appreciably from its previous analyzed position.

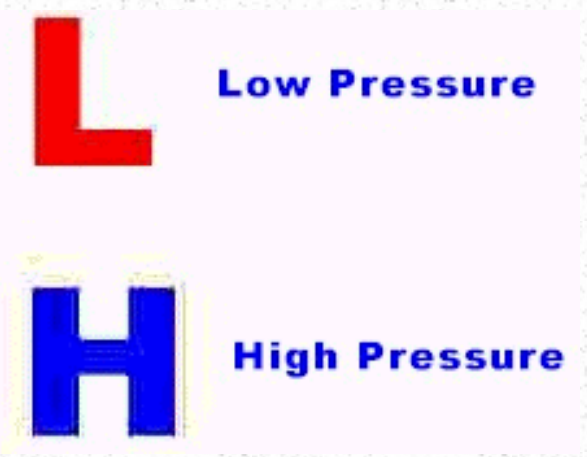
Trough

- [Trof], an elongated area of relatively low pressure that is typically associated with a cyclonic wind shift.

Warm front

- The leading edge of a relatively warmer surface air mass which separates two distinctly different air masses. The gradients of temperature and moisture are maximized in the frontal zone. Ahead of a typical warm front in the northern hemisphere, winds are from the southeast and behind the front winds will shift to the southwest.

LOW & HIGH PRESSURE SYSTEMS AND MISCELLANEOUS KEY TERMINOLOGY USED



Low pressure with a number such as 99 means 999 mb and with 03 means 1003 mb. High pressure with a number such as 25 means 1025 mb.

Extratropical low

- A low pressure center which refers to a migratory frontal cyclone of middle and higher latitudes. Tropical cyclones occasionally evolve into extratropical lows losing tropical characteristics and become associated with frontal discontinuity.

Low pressure

- An area of low pressure identified with counterclockwise circulation in the northern hemisphere and clockwise in the southern hemisphere. Also, defined as a cyclone.

High pressure

- An area of higher pressure identified with a clockwise circulation in the northern hemisphere and a counterclockwise circulation in the southern hemisphere. Also, defined as an anticyclone.

New

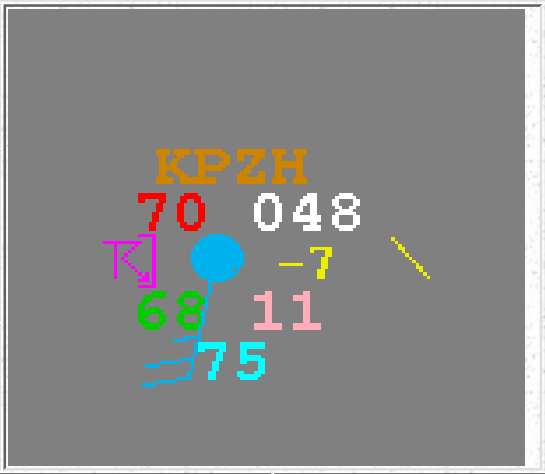
- The term "NEW" may be used in lieu of a forecast track position of a high or low pressure center when the center is expected to form by a specific time. For example, a surface analysis may depict a 24-hour position of a new low pressure center with an "X" at the 24-hour position followed by the term"NEW", the date and time in UTC which indicates the low is expected to form by 24 hours.

Rapidly intensifying

- Indicates an expected rapid intensification of a cyclone with surface pressure expected to fall by at least 24 millibar (mb) within 24 hours.

Station plot

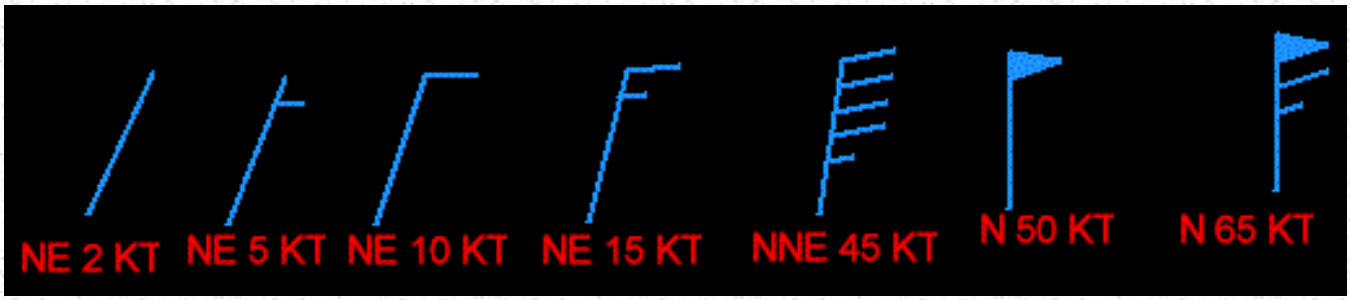
Click for information on *coding* used with the surface preliminary analysis or for a list of "present weather" symbols.

Station ID = KPZH		
temperature (F or C) = 70 = 70 degree F		**Station Pressure (mb) = 048 = 1004.8 mb**
present weather =  = thunderstorm		**3 hour pressure tendency = -7 \ = -0.7 mb pressure decrease with steady pressure f**
dew point temperature (F or C) = 68= 68 degree F		**wave height (ft or m) = 11 ft**
wind speed & direction = SSW 25 kt **sky cover = overcast**		**Sea Surface Temperature (F or C) = 75 = 75 degrees F**
		

Squall

- A sudden wind increase characterized by a duration of minutes and followed by a sudden decrease in winds.

Windspeed & Direction



FOG

Fog

- Over the marine environment the term fog refers to visibility greater than or equal to 1/2 NM and less than 3 NM. Fog is the visible aggregate of minute water droplets suspended in the atmosphere near the surface.

Dense fog

-Over the marine environment the term dense fog refers to visibility less than 1/2 NM. Fog is the visible aggregate of minute water droplets suspended in the atmosphere near the surface. Usually dense fog occurs when air that is lying over a warmer surface such as the Gulf Stream is advected across a colder water surface and the lower layer of the airmass is cooled below its dew point.

Sea fog

- Common advection fog caused by transport of moist air over a cold body of water.

FREEZING SPRAY

Freezing spray

- Spray in which supercooled water droplets freeze upon contact with exposed objects below the freezing point of water. It usually develops in areas with winds of at least 25 knots.

Categories of Freezing Spray/Icing

Light	Moderate	Heavy
Less than 0.7 cm/hr	0.7 cm/hr to less than or equal to 2.0 cm/hr	Greater than 2.0 cm/hr
Less than 0.3 ins/hr	0.3 ins/hr to less than or equal to 0.8 ins/hr	Greater than 0.8 ins/hr

CONVENTIONS USED WITH WARNINGS FOR EXTRATROPICAL SYSTEMS

Extratropical Systems

Complex gale/storm

-An area in which gale/storm force winds are forecast or are occurring, but in which more than one center is the generating these winds.

Developing gale

-Refers to an extratropical low or an area in which gale force winds of 34 knots (39 mph) to 47 knots (54 mph) are "expected" by a certain time period. On surface analysis charts a developing gale indicates gale force winds within the next 36 hours. When the term developing gale is used on the 48 hour surface forecast and 96 hour surface forecast charts, gale force winds are expected to develop by 72 hours and 120 hours, respectively.

Developing storm

-Refers to an extratropical low or an area in which storm force winds of 48 knots (55 mph) or greater are "expected" by a certain time period. On surface analysis charts a developing storm indicates storm force winds forecast within the next 36 hours. When the term developing storm is used on the 48 hour surface and 96 hour surface charts, storm force winds are expected to develop by 72 hours and 120 hours, respectively.

Gale

- Refers to an extratropical low or an area of sustained surface winds (one minute) of 34 knots (39 mph) to 47 knots (54 mph).

Storm

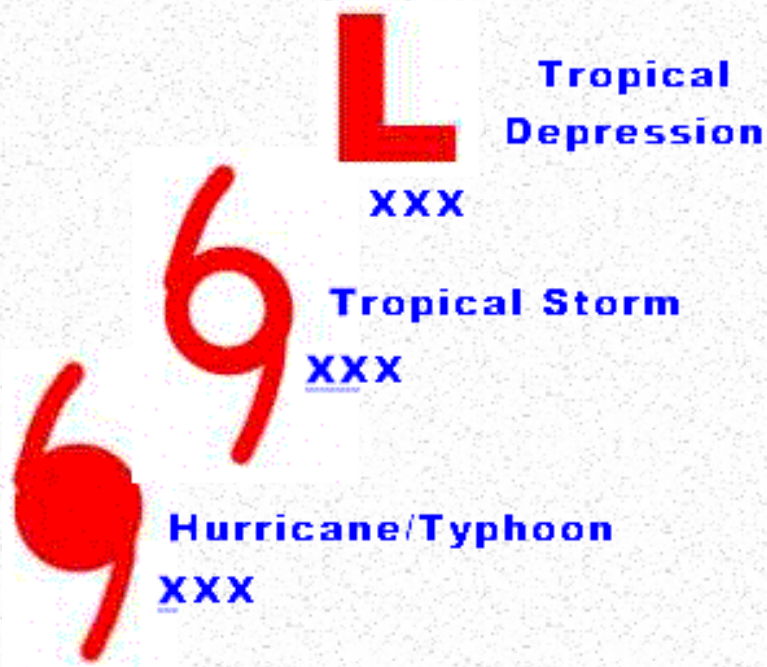
- Refers to a extratropical low or a area of sustained winds (one minute) in excess of 48 knots (55 mph).

Small Craft Advisory

- Refers to areas within the coastal waters with sustained winds (one minute) of 18 knots (21 mph) to 33 knots (38 mph).

CONVENTIONS USED WITH WARNINGS FOR TROPICAL SYSTEMS

Tropical Systems



Hurricane

- A tropical cyclone with closed contours, a strong and very pronounced circulation, and one minute maximum sustained surface winds 64 knots (74 mph) or greater. A system is called a hurricane over the North Atlantic, Gulf of Mexico, North Pacific E of the dateline, and the South Pacific E of 160E.

Tropical cyclone

- A non-frontal, warm-core, low pressure system of synoptic scale, developing over tropical or subtropical waters with definite organized convection (thunderstorms) and a well defined surface wind circulation.

Tropical depression

- A tropical cyclone with one or more closed isobars and a one minute max sustained surface wind of less than 34 knots (39 mph).

Tropical storm

- A tropical cyclone with closed isobars and a one minute max sustained surface wind of 34 knots (39 mph) to 63 knots (73 mph).

Typhoon

- Same as a hurricane with exception of geographical area. A tropical cyclone with closed contours, a strong and very pronounced circulation, and one minute maximum sustained surface winds of 64 knots (74 mph) or greater. A system is defined as a typhoon over the North Pacific W of the

dateline.

SEAS

Combined seas

-The combination of both wind waves and swell which is generally referred to as "seas".

Primary swell direction

- Prevailing direction of swell propagation.

Significant wave height

- The average height (trough to crest) of the 1/3rd highest waves. An experienced observer will most frequently report the highest 1/3rd of the waves observed.

Swell

- Wind waves that have moved out of their fetch or wind generation area. Waves generated by swell exhibit a regular and longer period than wind waves.

MISCELLANEOUS TERMINOLOGY

High Seas

- That portion of the Atlantic and Pacific oceans which is the area of responsibility of the Marine Prediction Center that extends from 20 to 40 nm off the Western and Eastern US coasts and extends to 35W in the Atlantic ocean and to 160E in the Pacific Ocean. The area includes both the coastal and offshore waters.

Offshore waters

- That portion of oceans, gulfs, and seas beyond coastal waters extending to a specified distance from the coastline, to a specified depth contour, or covering an area defined by a specific latitude and longitude points.

Marine Prediction Center's MFB Radiofacsimile Schedule

The Atlantic and Pacific Radiofacsimile schedules list product times of transmission, request for comments on products, and product notice bulletins. During periods of lost or bad data, transmission problems, etc., information on the nature of the problem will be substituted for the scheduled product or substituted in the beginning of each broadcast cycle in place of the test pattern, as time and resources permit. If there are available time slots with the U.S. Coast Guard transmission schedule and lesser schedules priorities, and the U.S. Coast Guard agrees, every attempt will be made to rebroadcast the product. Most likely, the retransmission will occur at the end of the scheduled broadcast cycle.

Tropical Prediction Center's Radiofacsimile Program

The counterpart to the Marine Prediction Center is the Tropical Prediction Center's Tropical Analysis and Forecast Unit which has responsibility for marine forecasts in the tropics and subtropics for the area S of 30N to the equator and E of 140W in the Pacific and S of 30N to the equator W of 35W in the Atlantic. The TAFB Radiofacsimile Program consists of two product suites: surface analysis products and marine forecast products. A east Pacific Wind/Seas Analysis is prepared by TAFB and is broadcast with forecast products from MPC through transmitters of the U.S. Coast Guard at Point Reyes, California with charts for 12Z and 18Z . The graphic includes winds in knots and seas state values in feet. The chart also includes Tropical systems with the latest analyzed position and wind speed. Refer to the latest MPC Pacific Radiofacsimile schedule for transmission times and broadcast frequencies of this product.

For further information on the Tropical Prediction Center's TAFB Radiofacsimile program and its latest schedule please E-mail your comments to the Tropical Prediction Center. Additional information can be obtained by phone: (305)-229-4430, fax: (305)-553-1264, or writing to:

Chief, TAFB
Tropical Prediction Center
11691 SW 17th St.
Miami, FL 33165-2149

Summary

In consultation with its users, MPC has designed a timely product suite of graphics and high seas marine warnings and forecasts. When displayed together and organized the charts provide the mariner with a complete meteorological and oceanographic picture. Prudent decision making dictates the mariner use all available information from as many sources as possible.

The MPC's Marine Radiofacsimile Charts and Warning Forecasts program is designed to assist mariners in making decisions regarding the protection of the crew from injury, prevention of ship and cargo damage, fuel economy, and meeting fixed schedules, as well as serving the commercial fishing and recreational communities. The product suite is based on user feedback and input, and is always subject to review and revision. We strongly encourage input from the marine user community.

For additional information contact:

National Weather Service
National Centers for Environmental Prediction
Marine Prediction Center
World Weather Building 5200 Auth Road, Room 410 Camp Springs, M.D. 20746
Attn: David Feit, W/NP41
Phone: 301-763-8441
Fax: 301-763-8592, 301-763-8085
Email:David.Feit@noaa.gov

Marine Prediction Center Home Page; URL: http://www.mpc.ncep.noaa.gov/

Last modified on Wednesday, October 18, 2000

[Home|Analysis|Forecast| Key terms|User's Guide|[Schedules Atlantic FAX|Pacific FAX| U.S.C.G. Text Forecasts]|Links|TIF Viewer]